



## Australian species of *Ommatius* Wiedemann (Diptera: Asilidae) with an anepimeral bristle

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### Abstract

The presence of an anepimeral bristle in Australian *Ommatius* Wiedemann species is newly recorded and descriptions of seven new species possessing this character are presented: *O. aquilonaris* sp. nov., *O. burwelli* sp. nov., *O. imaginis* sp. nov., *O. limbatus* sp. nov., *O. melasmus* sp. nov., *O. musselbrookensis* sp. nov. and *O. radamnis* sp. nov. All species occur in Queensland but *O. melasmus* sp. nov. also occurs in New South Wales and *O. musselbrookensis* sp. nov. also occurs in the Northern Territory. A key to separate the species is presented.

**Key words:** *Ommatius*, Asilidae, Ommatiinae, anepimeral bristle, robber flies, branched setae, Australia

### Introduction

*Ommatius* Wiedemann is one of the largest and most widely distributed genera of Asilidae and has representatives in all geographic regions (Hull 1962), with the Catalogue of Life (Roskov *et al.* 2015) listing more than 380 species. Like most groups of Australian Asilidae, the subfamily Ommatiinae with two Australian genera, *Ommatius* and *Cophinopoda* Hull, is in dire need of revision.

Thirteen names exist in the literature for species of *Ommatius* described from Australia, two of these are currently treated as junior synonyms whilst a further two have not been recognised in modern collections (Daniels 1989), leaving eleven recognisable species. All species are from the eastern Australian states (Daniels 2012).

Members of the subfamily/genus can be recognized by the closed cell m3 and setae on the anterior surface of the antennal style. Here I record the presence of branched setae on the lower occipital area and/or postgena (Fig. 1). These setae are present in all Ommatiinae genera examined (*Afroestricus* Scarbrough, *Cophinopoda*, *Emphysomera* Schiner, *Longibeccus* Scarbrough, *Merodontina* Enderlein, *Michotamia* Macquart, and *Ommatius*) (Torsten Dikow, *pers. comm.*). This character is not known for any other asilids and is a second autapomorphy supporting of the monophyly of the Ommatiinae.

Described species have a body length ranging from 10 mm (*O. flavicaudus* Malloch) to 26 mm (*O. mackayi* Ricardo). The species described here are much smaller, ranging in size from about 5.5 mm to a maximum length of about 10 mm.

### Discussion

Malloch (1928, p. 610) drew attention to the presence of the anepimeral (as pteropleural) bristle in African and Javan *Ommatius* specimens and Scarbrough (1984) used the presence or absence of this bristle to distinguish a species from the West Indies. Scarbrough (2002) created Neotropical species groups based on the presence or absence of the anepimeral bristle. No described Australian species is known to have an anepimeral bristle.

Hardy (1928) used the external features of the male terminalia in a key to the Australian species and the differences separating the species are readily found in there. This key was repeated verbatim by Hardy (1935) and apart from a new name (*O. fimbriatus*) being proposed by Hardy (1949), this was the last revision of the Ommatiinae in Australia.

Since then, Hull (1958) proposed the new genus *Cophinopoda* to include several species distributed around the Indian Ocean from Madagascar to New Guinea and Australia. Australia has a single mainland species, *C. garnotii* (Guérin-Méneville) and another *C. andrewsi* Oldroyd from the Australian Territory of Christmas Island in the Indian Ocean.

The anepimeral bristle is used here to distinguish a group of Australian species that may not be closely related phylogenetically. The bristle is pale in colour with a well-developed, basal socket (Fig. 3), anteriorly inclined and is located distad to the anepimeral cleft. *Ommatius aquilonaris* **sp. nov.** is the exception, usually having a single (sometimes up to three), thin hair-like bristle (Fig. 2), which is often broken and/or easily overlooked. *Ommatius aquilonaris* **sp. nov.**, *O. burwelli* **sp. nov.** and *O. melasmus* **sp. nov.** additionally have a group of fine anepimeral setae anterior to the anepimeral suture.

In females I have used the term hypoproct (Figs. 15, 16, 39, 49, 74, 90, 99, 100, 106) for the sclerite found ventrad to the cerci and appears to be membranously connected to tergite 9+10. A similar sclerite is present in males and is posteriad to the subepandrial sclerite and ventrad to the cerci. In the latter, the hypoproct is usually separated from the subepandrial sclerite by membrane but it can appear to be fused. In both sexes, the hypoproct has some diagnostic features, being either paired or fused and having varying degrees of emargination in the anterior and posterior margins.

*Ommatius imaginis* **sp. nov.** has a small, seemingly movable, thumb-like surstylus on the ventral surface of the epandrium (Figs 57, 58) and is probably not homologous with the epandrial surstylus found in the Leptogastrinae and Laphriinae.

Males have sternite 8 strongly tapered, the posterior margin being much wider than the anterior margin. However in *O. burwelli* **sp. nov.** (Fig. 41) this segment is extremely narrow and crescent-shaped.

Several described species have males with the costal margin of the wing noticeably expanded but none of the new species has an obviously dilated costal margin. Londt (1981) defined wings as being dilated or expanded when their maximum breadth occurred distal of the vein r-m (just anterior to the discal cell); unexpanded wings were broader proximal of vein r-m. Scarbrough (1997) modified this definition to "...produced or dilated when their maximum breadth occurred beyond the junction of veins Sc and C; wings with a more or less straight costal margin have the greatest breadth before this junction". Using either of these definitions, the wings of *Ommatius burwelli* **sp. nov.**, *O. imaginis* **sp. nov.**, *O. melasmus* **sp. nov.** and *O. musselbrookensis* **sp. nov.** are dilated, respectively being 0.15, 0.05, 0.05, and 0.05 mm wider at their maximum (proximal to junction of vein M3 and posterior wing margin), compared with their widths at r-m or Sc and C. I am not certain if such small differences can be translated into a dilated wing. Further studies need to be done on the Australian species to determine if Londt's and/or Scarbrough's definition needs modification.

*Ommatius imaginis* **sp. nov.**, *O. musselbrookensis* **sp. nov.** and *O. radamnis* **sp. nov.** are similar in general morphology. In males, the terminalia are the primary means of identification. In females, the distal margin of sternite 8 is a reliable character in ethanol preserved specimens, in dried specimens this character is usually not very obvious.

## Materials and methods

Specimens examined under a Zeiss Stemi SV6 microscope and characters were measured with an ocular micrometre. The genital segments of the examined specimens were macerated in 10% KOH for approximately 8 hours at 20°C then transferred to a water bath for dissection. The structures were placed on a water-based lubricating gel (KR personal lubricant), flooded with 80% ethanol, then photographed. Tergite and sternite 8 were placed on a cavity microscope slide in 80% ethanol, a cover slip placed over the cavity, flattened and then photographed. After examination dissections were placed in a microvial containing glycerol and pinned below the specimen. Specimens were photographed at sequential focal planes using either a Canon EOS 5Ds or a Canon 7DMkII cameras and then compiled with Zerene stacking software and edited with Photoshop CS6 software.

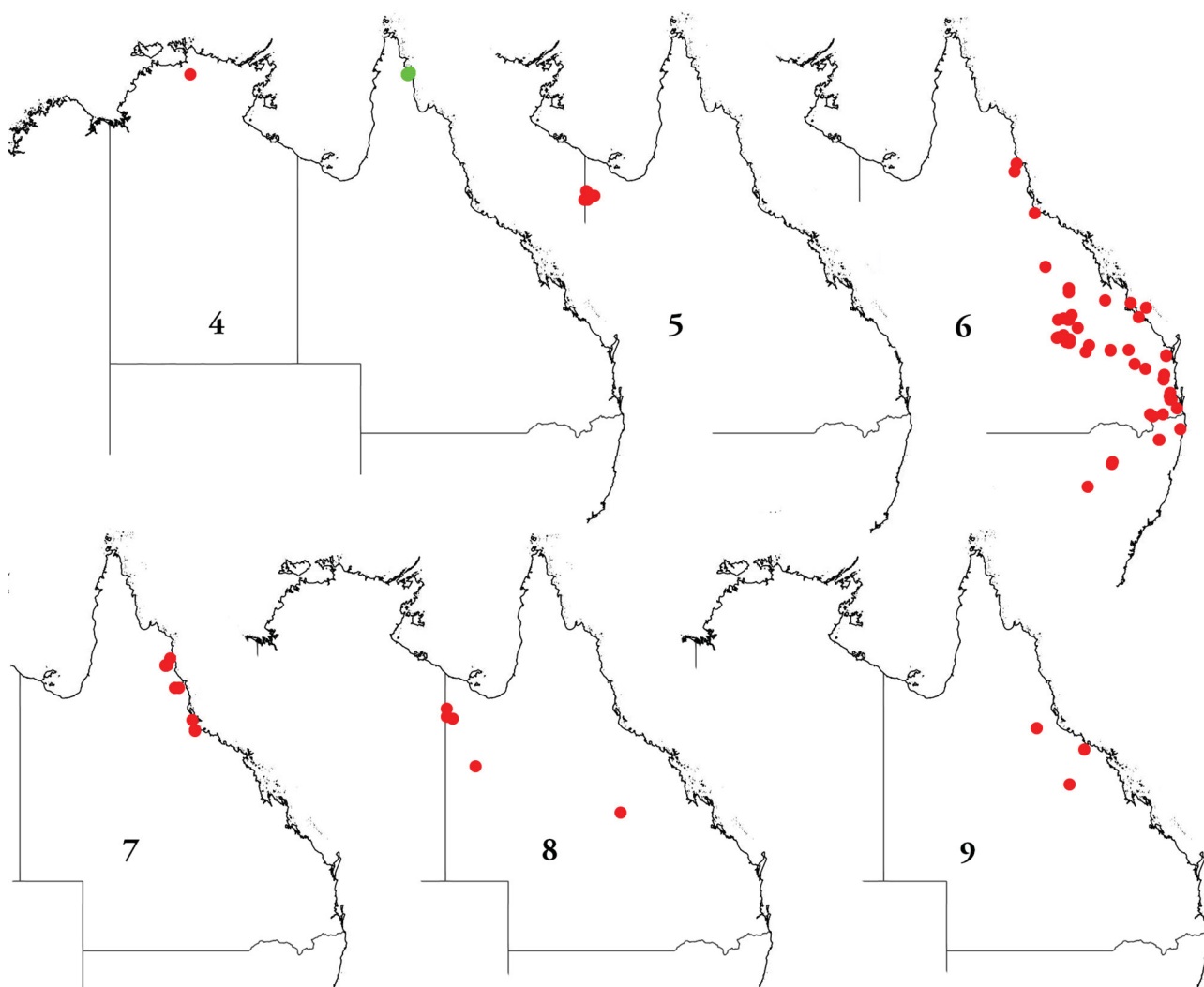
Labels. Holotype label data are quoted exactly as they appear. A slash (/) denotes the commencement of a new line, two division slashes (//) data on additional label(s). The month of collection for all other specimens is standardised as Roman numerals.

The posterior margin of figures in the plates are aligned either to the top or to the right hand side of the page.



**FIGURES 1–3.** (1) *Ommatius distinctus* Ricardo. Branched setae on postgena (vertical, near centre) and lower occipital area (remainder). (2–3). Anepimeral bristle of (2) *O. aquilonaris* **sp. nov.** (poorly developed) and (3) *O. musselbrookensis* **sp. nov.** (well developed).





**FIGURES 4–9.** Distribution of *Ommatius* spp. with anepimeral bristle. (4). *O. radamnis* sp. nov. (red circle) and *O. aquilonaris* sp. nov. (green circle); (5). *O. musselbrookensis* sp. nov.; (6). *O. melasmus* sp. nov.; (7). *O. burwelli* sp. nov.; (8). *O. imaginis* sp. nov.; (9). *O. limbatus* sp. nov.

Distribution maps were generated using the Mapping and Analysis portal of the Atlas of Living Australia (La Salle, 2015).

Terminology follows McAlpine (1981), Geller-Grimm (2015) and Dikow (2009). I have used the term bristle(s) for large seta(e) rather than the term macro-seta(e).

**Abbreviations.** Institutes: AM, Australian Museum, Sydney; QM, Queensland Museum Brisbane; USNM, US National Museum, Washington.

Australian States: NSW, New South Wales; NT, Northern Territory; Qld, Queensland.

## Results

### Taxonomy

#### Key to Australian *Ommatius* species with an anepimeral bristle

- |    |   |                                |
|----|---|--------------------------------|
| 1. | Anepimeral bristle well developed (Fig. 3) . . . . .  | 2                              |
| -  | Anepimeral bristle weak (Fig. 2); femora yellowish brown, hind femur brown on apical half . . . . . | <i>O. aquilonaris</i> sp. nov. |
| 2. | Cell br with dense microtrichia in at least the distal third. . . . .                               | 3                              |
| -  | Cell br without dense microtrichia . . . . .  | 6                              |



3. Scutellum with two long marginal setae ..... 4
- Scutellum without marginal setae ..... *O. limbatus* **sp. nov.**
4. Sternite 2 with long erect setae more or less confined to anterior margin ..... 5
- Sternite 2 with long, erect setae scattered over most of surface ..... *O. radamnis* **sp. nov.**
5. Hind tibia yellow-brown, brown-black distally, ventrally the darkening begins at about middle; male terminalia (Figs 44–46); hypandrium not swollen and with four long, black, posteriorly directed setae; epandrium with a ventral, posteriorly directed process which usually has a long subapical seta; sternite 8 (Fig. 52) in females longer than broad, with a small apical median carina and with posterolateral lobe bearing a stout bristle ..... *O. imaginis* **sp. nov.**
- Hind tibia yellow-brown, brown-black distally, ventrally the darkening begins almost at base; male terminalia (Figs 85–87); hypandrium medially swollen and with a apical fan of 4 black, posteriorly directed setae; epandrium with a ventral, poster-oventrally directed, semi-transparent, blade-like process; sternite 8 (Fig. 93) in females as long as broad, distal margin with margin with a small medial notch and a larger submedial notch bearing a long black bristle which arises near its base ..... *O. musselbrookensis* **sp. nov.**
6. Hind femur yellow with a black, anterodorsal, subapical spot, sometimes extending around the femur; wing length 5.1–6.5 mm ..... *O. melasmus* **sp. nov.**
- Hind femur orange-brown basally, black on apical half; wing length 7.5–8.7 mm ..... *O. burwelli* **sp. nov.**

***Ommatius aquilonaris* sp. nov.**

(Figs 2, 4, 10–27, 110)

**Diagnosis.** The combination of shining tomentum on the thoracic sclerites, a very weak anepimeral bristle (Fig. 2), semi-transparent legs, and in males, sternites 3 and 4 with lateral bristles, barbed setae on the apical portion of the gonocoxite (Figs 10, 11) and the basally fused hypandrium and gonocoxite (Figs 13, 19) characterize this species.

**Type material.** **HOLOTYPE** ♂, AUSTRALIA. **Queensland.** rainforest // West Claudie River, / 4 km SW road junction / Qld 1244°S 14315°E / 29 Nov 1986 / G. Daniels / M.A. Schneider / (QM Reg. No. UQIC7554).

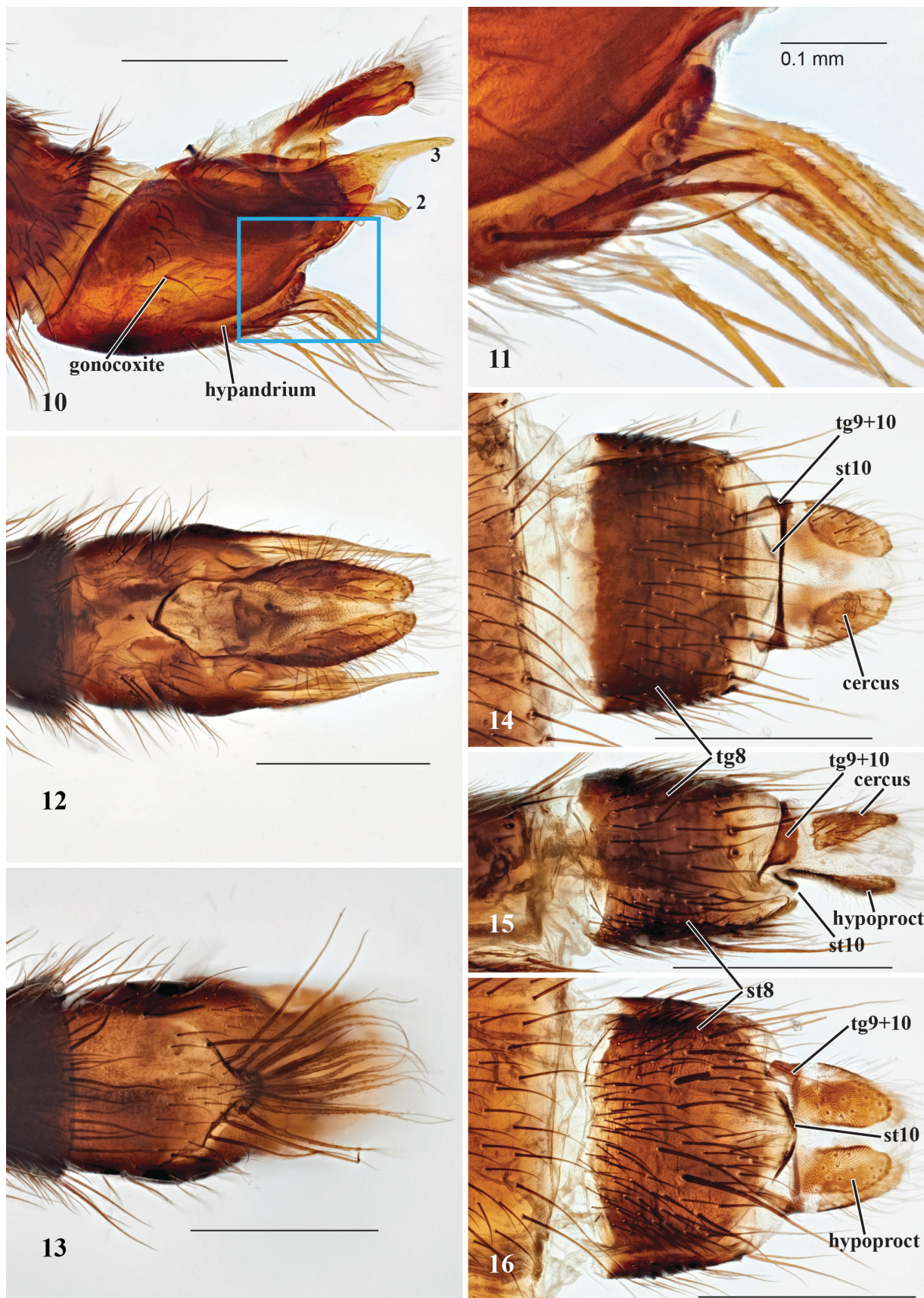
**PARATYPES.** **Queensland.** 2 ♀, 4–5 km SW Portland Roads 6.vii.1982 G. Daniels M.A. Schneider (QM); 1 ♀, approx. 11 km from Portland Roads on Iron Range Road 21.ix.1974 M.S. Moulds (AM); 1 ♂, 3 ♀, Gordon Creek area, Claudie Riv. district 24.vi.–4.vii.1982 M.A. Schneider G. Daniels UQIC7342 (QM); 1 ♂, 4 ♀, Gordon Creek, Claudie Riv. district 1242°S 14317°E 10.xii.1986 G. Daniels M.A. Schneider (QM); 1 ♂, 3 ♀, Gordon Ck, Claudie Riv. District 1242.79°S 14317.97°E 50 m 2–4.i.1995 G. and A. Daniels rain forest (AM); 2 ♂, same data except 28.xii.1995–2.i.1996 (AM); 1 ♂, same data except 7.xii.1997 G. Daniels (AM); 2 ♂, 4 ♀, hut nr East Claudie Riv., Iron Ra. Nat. Pk 1242°37'S 14317°32'E 1–4.i.1996 G. and A. Daniels (AM); 1 ♀, beginning of Mt Lamond track, Iron Ra. Nat. Pk 1243°34 S 14217°06'E 2.i.1996 20 m G. and A. Daniels (AM); 1 ♂, East Claudie Riv. Iron Range site 2, 12.43°41'S 143.17°01'E 3.i.1996 20 m G. and A. Daniels (AM); 1 ♀, Iron Ra., West Claudie R., r'forest 7.xii.1985 D. Yeates (QM); 1 ♀, Phillip Hill, Iron Range, Claudie Riv. Dist. 1244°S 14318°E 9.i.1994 G. and A. Daniels (AM); 7 ♂, 3 ♀, same data except 4.i.1996 140 m (AM); 2 ♂, same data except 7.vi.1995 G. Daniels (AM); 12 ♂, 4 ♀, Middle Claudie Riv., Iron Range 11.ix.–2.xi.1974 G. Daniels (AM); 2 ♂, 1 ♀, Iron Range 1.v.–2.vi.1975 M.S. Moulds (AM); 1 ♂, West Claudie Riv., Iron Ra. 20.ix.1974 M.S. Moulds (AM); 5 ♀, West Claudie Riv., Iron Range Nat. Park 1244.48°S 14314.81°E 50 m 2.i.1995 G. and A. Daniels (AM); 2 ♀, West Claudie R., Iron Range 50m 3–10.xii.1985 G. Monteith & D. Cook rainforest (QM); 3 ♂, 5 ♀, same data except 1243°S 14312°E 50 m 11.vi.1995 G. Daniels (AM); 1 ♂, 2 ♀, same data except 19.ix.2000 50 m G. and A. Daniels on twig, rain forest (AM); 2 ♂, 3 ♀, West Claudie Riv. x-ing, Iron Range, 50 m 1244°S 14319°E 8–9.i.1994 G. and A. Daniels R. Eastwood (AM); 1 ♀, West Claudie Riv., 3.5 km W of road junction, Iron Range 1244°09 S 14315°43"E 20 m 2.vii.1997 G. and A. Daniels (AM); 2 ♀, same data except 19.ix.2000 on twig, rain forest (AM); 1 ♂, 4 ♀, West Claudie River, 4 km SW road junction 1244°S 14315°E 26.xi.–6.xii.1986 G. Daniels M.A. Schneider (QM); 8 ♂, 4 ♀, same data except 28.xi.–8.xii.1986 malaise (QM); 1 ♂, 1 ♀, West Claudie River, 4 km SW road junction 1244.05°S 14315.84°E 40 m 31.xii.1994 G. Daniels rain forest (AM); 1 ♀, 1 km N of 'Eclectus', Iron Ra. 1245°45'S 14317°11"E 5.vii.1997 G. and A. Daniels (AM); 1 ♀, 'Eclectus', Iron Range, 1245°46"S 14317°10"E 20 m 10.vi.1995 G. Daniels (AM); 1 ♂, 2 ♀, same data except 28.xii.1995–3.i.1996 G. and A. Daniels (AM); 2 ♂, 1 ♀, same data except 4.xii.1997 G. Daniels (AM); 1 ♀, same data except 26.vii.1999 G. and A. Daniels (AM); 1 ♂, 1 ♀, same data except 20.v.2002 G. Daniels on twig in rainforest (AM); 2 ♂, 1 ♀, same data except 9.x.2004 G. and A. Daniels on twig rain forest (AM); 1 ♂, 2 ♀, same data except 1.viii.2006 (AM); 1 ♂, 4 ♀, same data except 13–20.ix.2005 G. Daniels on twig rain forest (AM); 13 ♂, 18 ♀, same data except 16–18.x.2003 rain forest on twig 15–30 cm above ground (AM); 1 ♀, same data except 31.vii.2006 G. and A. Daniels rain forest (AM); 1 ♂, swamp nr lower Claudie Riv. sthn bank, Cape York Pen. 25.ix.1974 M.S. Moulds (AM).

**Non-type material examined.** 1 ♀, Phillip Hill, Iron Range, Claudie Riv. Dist. 12°44'S 143°18'E 9.i.1994 G. and A. Daniels (AM); 2 (damaged), West Claudie River, 4 km SW road junction 12°44'S 143°15'E 29.xi.–5.xii.1986 malaise (QM).

**Description. Male.** Body length, 8.2–8.9 mm; thoracic length, 2.1–2.3 mm; wing length, 6.2–6.6 mm. **Head.** Face gently rounded, barely protruding beyond eyes in profile and with shining pale yellowish to white tomentum. Mystax with two vertical rows of long thin black bristles; with a medial group of stouter, white bristles above epistoma; lower half of face and along epistomal margin white setose. Ocellar tubercle with short (rarely long) black reclinate setae. Occiput with 4 to 6 long black setae dorsally, weaker and white ventrally. Beard sparse and with branched hairs. Flagellum conical, slightly flattened laterally and longer than pedicel. Style with setae in one rank on basal half, then two distally. **Thorax.** Ground-colour orange-yellow, mesonotum dorsally and scutellum brown-black. Lateral pleural sclerites silvery tomentose; mesonotum with sparse coppery tomentum, becoming silvery laterally; postpronotal lobe with a few long, pale setae anteriorly. Acrostichal setae seemingly absent but visible when viewed in profile. Presutural dorsocentral bristles absent; 2 pairs of postsutural dorsocentral bristles and 2 long marginal scutellar bristles present; scutellar disc with a few weak, scattered setae. Anepisternum with a few weak setae. Anepimeral bristle (Fig. 2) poorly developed and barely discernable from other nearby setae; anepimeron with a group of fine setae anterior to the anepimeral cleft. **Wing** (Fig. 110). With microtrichia distributed over apical fourth of wing, present apically in cell r1, cell r2+3, cell r5, cell m1 and cell m2. Costal dilation absent. Vein R4+5 not fused basally to vein R3. Vein r-m well beyond middle of discal cell. **Legs.** Semi-transparent. Femora black, narrowly orange-brown apically. Tibiae orange-brown, darker apically, hind tibia dark brown-black on apical half. Fore and mid metatarsi orange-brown, hind metatarsus brown-black; remainder of tarsal segments brown-black. Fore femur with a ventral row of long, weak setae. Mid femur with an anterior bristle at about middle and another at apical third; a posteroventral row of 4 or 5 weak bristles and a ventral row of weak bristles. Hind femur with an anterior bristle at about middle and another at apical third; an anteroventral row and a posteroventral row of 4 or 5 short, stout bristles. Fore tibia with 2 long posteroventral setae; a short subbasal dorsal seta; a ventral row of 5 weak setae. Mid tibia with a stout anterodorsal bristle at about apical fourth and a similar ventral bristle at about apical third; an anteroventral bristle at about basal third, and a posteroventral row of 3–5 long fine setae, the basal one being the longest and about half the femoral length. Hind tibiae with a subapical anterodorsal bristle and another longer anterior one at apical third; a dorsal and an anteroventral bristle at about middle. **Abdomen.** Tergites brown, tergites 1–5 pale yellowish posterolaterally, tergites 2–4 pale yellowish on posterior margin. Posterolateral tergal bristles very weak or absent. **Terminalia.** (Figs 10–13, 17–23). Brown. Tergite 8 (Fig. 21) about half the width of tergite 7; tergite 8 with anterior margin deeply indented and with numerous black, bristles on posterior margin. Sternites 1–7 pale yellowish in dried specimens, transparent in ethanol stored specimens. Sternite 3 with a posterolateral bristle, sternite 4 with a row of lateral bristles, sternite 5 often with an anterolateral bristle. Sternite 8 (Fig. 22) with convex posterior margin and deeply emarginate anterior margin. Cerci (Fig. 12) about 6 times longer than wide, about half the length of epandrium and extending almost to its apex. Subepandrial sclerite (Fig. 23) long and narrow, deeply emarginate on posterior margin and setose laterally. Epandrium (Figs 17, 18) long and narrow, not fused basally but with a narrow, sub-basal apodeme; attenuate and with a complex, 3-pronged distal margin. Hypandrium and gonocoxite (Figs 10, 19) fused basally and almost tubular. Hypandrium (Figs 10, 13, 19) with a subapical fan of numerous, stout bristles; apically with a brush of branched or barbed bristles (Fig. 11); dorsal margin apically with a complex bilobed, proximally toothed process. Gonostylus long and narrow. Aedeagal complex (Fig. 20) with short, narrow, tubular distiphallus; basiphallus proximally with a dorsal, toothed, domed process; ejaculatory apodeme extremely long and narrow; ventral aedeagal apodeme less than half as long as ejaculatory apodeme and dorsally directed proximally.

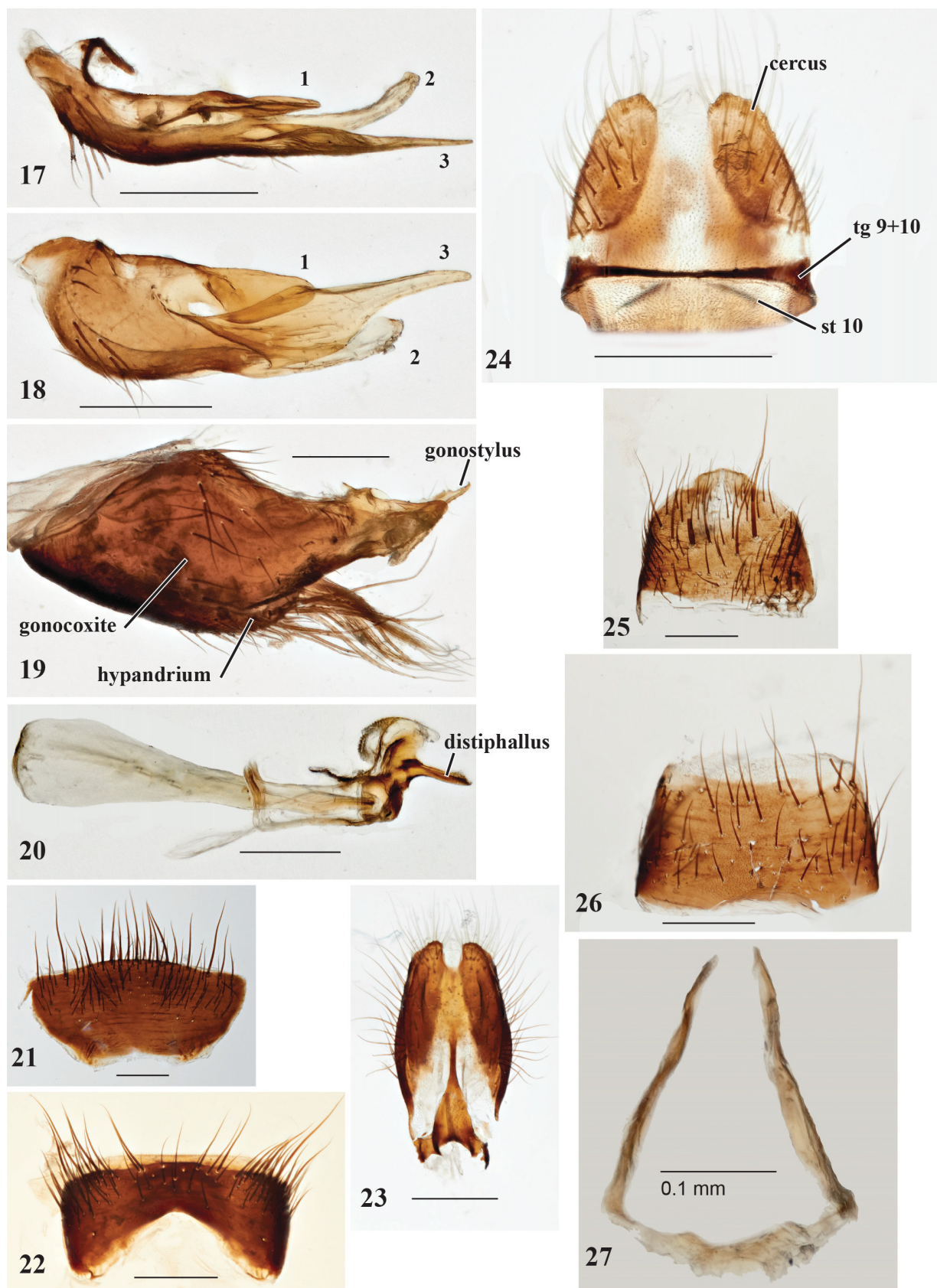
**Female.** Differs from male as follows: Body length, 7.5–9.0 mm; thoracic length, 2.0–2.4 mm; wing length, 6.0–7.2 mm. **Abdomen.** Tergite 2 pale yellowish on posterior margin; sternites 3–5 lacking lateral bristles. **Terminalia.** (Figs 14–16, 24–27). Sternite 8 (Fig. 25) with 3 or 4 long, stout bristles and numerous shorter stout bristles; distal margin somewhat rounded and with 2 membranous, submedial areas and a very small medial emargination. Genital fork (Fig. 27) simple, basal half semi-membranous, arms weakly sclerotized and anterior part even less sclerotized. Tergite 9+10 (Figs. 14–16, 24) extremely narrow medially (approx. 0.01 mm) and wider laterally (approx. 0.03 mm); anterior margin more or less straight, posterior margin concave. Sternite 10 (Figs. 14–16, 24) present as two small, elongate sclerites. Hypoproct (figs 15, 16) not fused, longer than cerci. Cerci fully visible in pinned specimens.





**FIGURES 10–16.** *Ommatius aquilonaris* sp. nov. (10–13) Male terminalia. (10). Lateral view; (11). Enlarged section of Fig. 10 showing barbed setae; (12). Dorsal view; (13). Ventral view. (14–16). Female terminalia. (14). Dorsal view; (15). Lateral view; (16). Ventral view. Abbreviations: st, sternite; tg, tergite. For #2 and #3 see figs 17–18. Scale bar, 0.5 mm.





**FIGURES 17–27.** *Ommatius aquilonaris* sp. nov. (17–20). Male terminalia (17). Epandrium dorsal view; (18). Epandrium lateral view (1, 2 and 3 refer to the epandrial lobes); (19). Hypandrium, gonocoxite and gonostylus, lateral view; (20). Aedeagal complex; (21). Tergite 8; (22). Sternite 8; (23). Subepandrial sclerite and cerci, ventral view (24–27). Female terminalia (24). Tergite 9+10, sternite 10, cerci; (25). Sternite 8; (26). Tergite 8; (27). Genital fork. Abbreviations: st, sternite; tg, tergite. Scale bar, 0.25 mm and as indicated.

**Etymology.** The specific name is derived from the Latin *aquilonaris*, 'northern', the most northerly species dealt with in this revision.

**Distribution** (Fig. 4). Known only from the Iron Range area, Cape York Peninsula, northern Qld.

***Ommatius burwelli* sp. nov.**

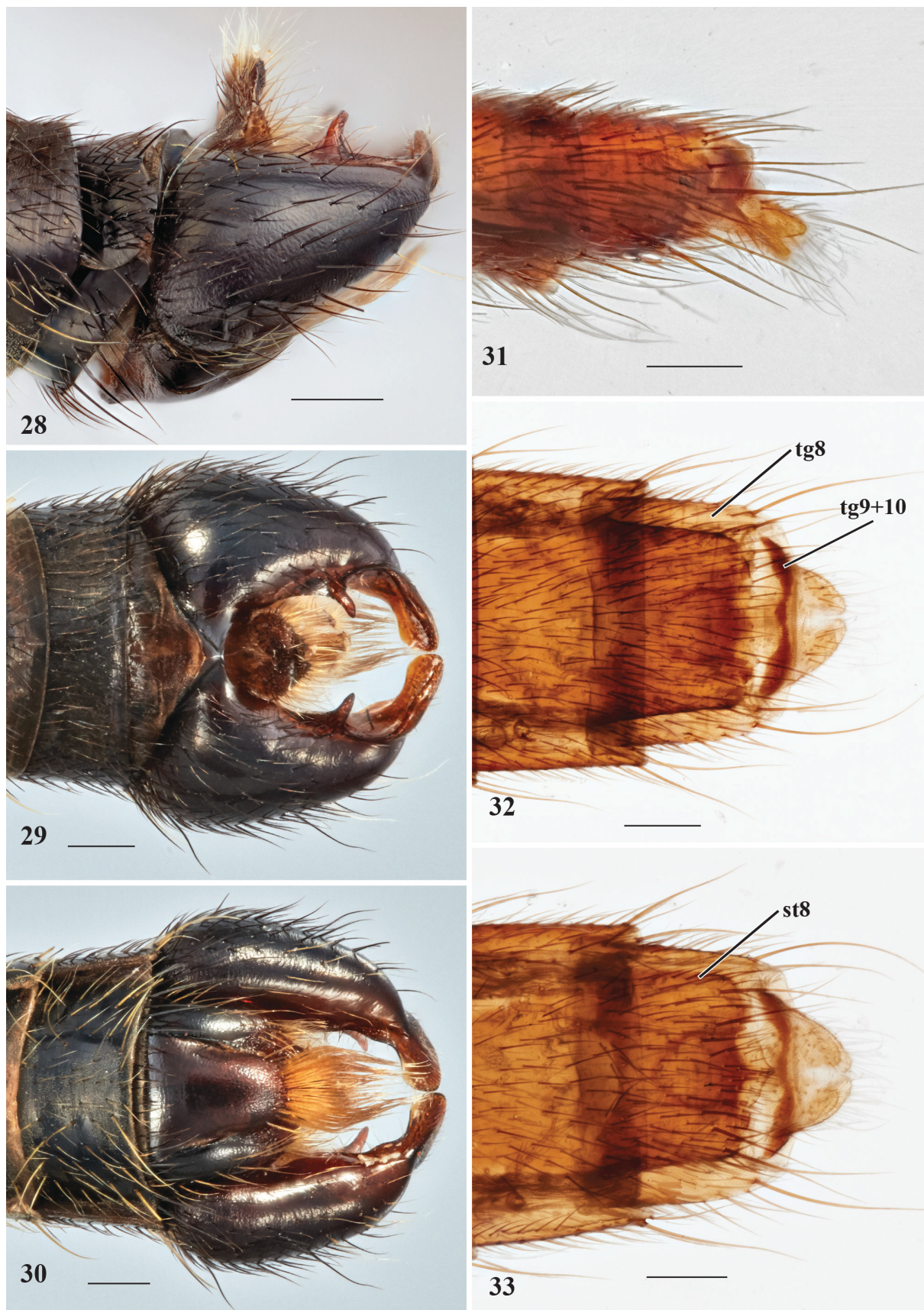
(Figs 7, 28–43, 111)

**Diagnosis.** A dingy species with pale brown hyaline wings and dense microtrichia in anterior half of cell r1 and extending distally to level of junction of veins Sc and C. The costal margin of males is slightly dilated.

**Type material.** **HOLOTYPE** ♂, AUSTRALIA. **Queensland.** 1 ♂, NEQ: 16°14'S 145°00'E / Windsor Tableland, / 5.7 km past barracks / 24Nov.1997 1300m / C.J. Burwell rainforest / (QM Reg. No. T207013); **PARATYPES.** **Queensland.** 2 ♀, 16°14'S 145°00'E Windsor Tableland, 5.7 km past barracks 24.xi.1997 1300m C.J. Burwell rainforest (QM); 1 ♀, NEQ: 16°13'S 145°59'E Windsor Tableland, NW open sclerophyll forest, 23–24.xi.1997 1100m C.J. Burwell (QM); 1 ♂, 1 ♀, Windsor Tableland NW of Mossman (site 1) 810 m 1612'51S 14504'09E 5.i.1994 G. and A. Daniels R. Eastwood (AM); 1 ♀, Mt Windsor Tableland NW of Mossman (site 2) 1100 m 1612'50S 14459'06E 5.i.1994 G. and A. Daniels R. Eastwood (AM); 1 ♂, Mt Misery SW of Cooktown 1552'S 14513'E 867 m 5.i.1994 G. and A. Daniels R. Eastwood (AM); 1 ♀, Herberton Ra., 4.5 km W Atherton, rainforest, 1100 m, 25.xi.1985, D.K. Yeates (QM); 1 ♂, Lake Eacham Nat. Pk, Atherton Tableland 27.xii.1969 V. Stablum (QM); 1 ♂, 1 ♀, 19 km W of Paluma 1845'S 14615'E 18.xii.1994 L.R. Ring (AM); 1 ♂, 3 ♀, Bluewater State Forest NW of Townsville (site 2) 1913.74'S 14624.04'E 15.i.1995 640 m G. and A. Daniels wet sclerophyll (AM); 3 ♂, 8 ♀, same data except (site 3) 15.i.1995 720 m 1912.45'S 14624.61'E rain forest (AM); 1 ♂, 5 ♀, same data except 1914.15'S 14624.18'E 13–14.i.1995 580 m (AM); 1 ♂, 7 ♀, same data except (site 4) 1912.28'S 14624.61'E 15.i.1995 700 m rain forest (AM).

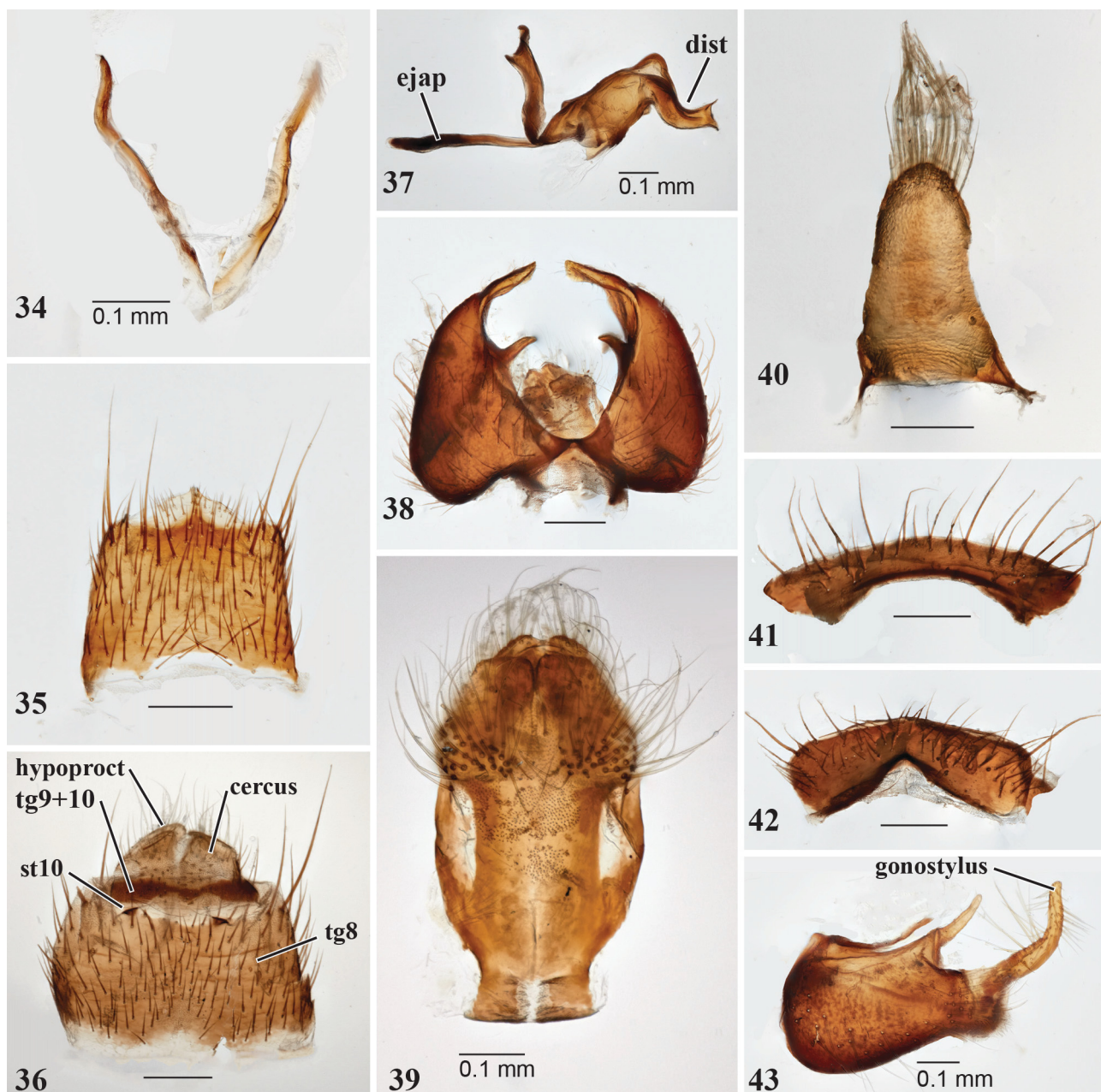
**Description.** **Male.** Body length, 10.1 mm; thoracic length, 2.8 mm; wing length, ♂ 8.1 mm. **Head.** Face gently rounded, barely protruding beyond eyes in profile and with yellowish tomentum. Mystax with 2 vertical rows of 6 or 7 long thin black bristles, admixed with shorter bristles. Bristles on lower half of face and epistomal margin weaker, shorter and yellowish. Ocellar tubercle with a pair of long proclinate setae. Flagellum longer than pedicel, conical and laterally flattened. Style with setae in one rank on basal half, then two distally. **Thorax.** Ground colour black, lateral pleural sclerites with yellowish tomentum; mesonotum with brownish tomentum, becoming yellowish laterally; postpronotal lobe tomentose and with a few long weak setae. Acrostichal setae seemingly absent but when viewed in profile setae are discernible. Presutural dorsocentral bristles absent; 4 or 5 pairs of postsutural dorsocentral bristles present. Scutellum with a pair of long, black marginal setae; disc with a few weak, scattered setae. Anepisternum with weak setae. Anepimeron with a group of fine setae anterior to the anepimeral cleft. **Wing** (Fig. 111). Smoky brown hyaline; dense microtrichia present in anterior half of cell r1 and extending distally to junction of veins Sc and C, then extending along posterior margin of wing to cell cua1, absent from discal cell and cell m3. Costal bulge present but very small. Cells r1 and r2+3 strongly rippled. Vein R4+5 not fused basally to vein R3. **Legs.** Fore and mid femora black, narrowly orange-yellow at base. Hind femur black, orange-brown proximally. Tibiae orange-brown becoming darker distally, hind tibia dark brownish on apical half. Fore and mid metatarsi orange-brown, hind metatarsus brown-black; remainder of tarsal segments brown-black. Fore femur ventrally with a row of long fine setae along length. Mid femur with an anterior bristle at about middle and another at apical third; a ventral row of up to 11 long, weak bristles. Hind femur with an anterior bristle at about middle and another at apical third; a ventral row of 4 or 5 short, stout bristles and a posteroventral row of 7 or 8 long fine bristles. Fore tibia with 2 long posteroventral setae; a short subbasal dorsal seta; a ventral row of 6 or 7 long fine setae. Mid tibia with a long, stout anterodorsal bristle at midpoint and apical third and a much weaker, shorter one at basal fourth; a long, stout anteroventral bristle at basal fourth; a row of dorsal and ventral setae. Hind tibia with an anterior bristle at midpoint, an anterodorsal bristle subbasally and another at apical third; posteroventrally with a subbasal bristle, and one at basal third, midpoint and at apical fourth. **Abdomen.** Dark brownish, apical segments a little darker. Segments 2–4 with distinctly paler posterior margins. Weak posterolateral bristles apparent only on tergites 5–7; sternites without distinct bristles except for sternite 8 with numerous bristles along posterior margin; in dissected specimens each sternite is narrower than the previous one, with sternite 4 being the narrowest, sternites then widening distally. **Terminalia** (Figs 28–30, 37–43) black, wider than segment 8.





**FIGURES 28–33.** *Ommatius burwelli* sp. nov. (28–30). Male terminalia. (28). Lateral view; (29). Dorsal view; (30). Ventral view. (31–33). Female terminalia. (31). Dorsal view; (32). Lateral view; (33). Ventral view. Abbreviations: st, sternite; tg, tergite. Scale bar, 0.25 mm.





**FIGURES 34–43.** *Ommatius burwelli* sp. nov. (34–36). Female terminalia. (34). Genital fork; (35). Sternite 8; (36). Tergites 8, 9+10, sternite 10, cerci (dorsal view). (37–43). Male terminalia (37). Aedeagal complex; (38). Epandria, dorsal view; (39). Subepandrial sclerite, ventral view; (40). Hypandrium, ventral view; (41). Sternite 8; (42). Tergite 8; (43). Gonocoxite and gonostylus, lateral view. Abbreviations: dist, distiphallus; ejap, ejaculatory apodeme; tg, tergite. Scale bar, 0.25 mm and as indicated.

Tergite 8 (Fig. 42) with a strongly emarginate anterior margin, medially about half as wide as lateral margin and tergite 7; posterior margin convex. Sternite 8 (Fig. 41) very narrow with convex anterior and concave posterior margins; medially being about one-third the width of sternite 7 and becoming slightly wider laterally. Epandrium (Figs 28, 29, 38) almost completely divided, being fused narrowly at base and with a small weakly sclerotized proximal area; broad basally, narrowed distally, posteriorly inwardly hooked and with a subapical, inwardly directed, dorsal prong. Subepandrial sclerite (Fig. 39) about twice as long as wide, constricted distally, with a sublateral, transparent, membranous area; ventral surface medially with an area of dense, short, setae and distally with a bulbous lateral area bearing long bristles; posterior margin with a deep cleft. Hypandrium (Fig 40) and gonocoxite (Fig. 43) not fused. Hypandrium (Figs 30, 40) elongate, widest at base, and with a dense tuft of long, pale bristles, which are sometimes semi-fused basally. Gonocoxite (Fig. 43) with a narrow, attenuate dorsal

apodeme near middle and another smaller apodeme proximally. Gonostylus (Fig. 43) narrow, attenuate, curved distally, and with long setae along length. Aedeagal complex (Fig. 37): with a long, narrow ejaculatory apodeme; basiphallus long and distally with a dorsal carina which extends to distiphallus; distiphallus short, curved; ventral aedeagal apodeme arising directly from basiphallus in a dorsal direction.

**Female.** Differs from male as follows: Body length, 7.6–10.0 mm; thoracic length, 2.3–2.7 mm; wing length, 7.5–8.7 mm. **Wing** hyaline. Cells r1 and r2+3 not rippled. **Abdomen.** Segments 2–4 without distinctly pale posterior margins. Tergite 8 (Fig. 33) with 2 long, black posterolateral bristles on each side. Sternites not narrowed near middle of abdomen. **Terminalia** (Figs 31–36). Tergite 8 (Fig. 36) about twice as long as wide, with a long bristle at posterolateral margin. Sternite 8 (Fig. 35) slightly wider than long; posterior margin with a setose membranous area divided by a narrow sclerotized medial area. Genital fork (Fig. 34) with a pair of semi-sclerotized straight arms, weakly joined proximally; distal section of arms lifted dorsally. Tergite 9+10 (Fig. 36) narrow and of uniform width except for a small, narrow submedial area. Sternite 10 (Fig. 36) present as two small sclerites. Hypoproct (Figs 33, 36) emarginate, fused, membranous and setose medially. Cerci fully exposed in pinned specimens.

**Etymology.** Named in honour of Chris Burwell of the Queensland Museum.

**Distribution** (Fig. 7). Known only from the Windsor Tableland, Mt Misery, Atherton Tableland and the Paluma Range, northern Qld.

### *Ommatius imaginis* sp. nov.

(Figs 8, 44–59, 112)

**Diagnosis.** This species is very similar in appearance to *O. musselbrookensis* sp. nov. and the two species are sympatric in the north western part of the distribution of *O. imaginis* sp. nov. Males can be easily distinguished on features of the terminalia. Females can be distinguished by the shape of sternite 8 and the position of bristle on the distal margin. The extent of the yellow-brown area of the hind tibia can also aid in separating females.

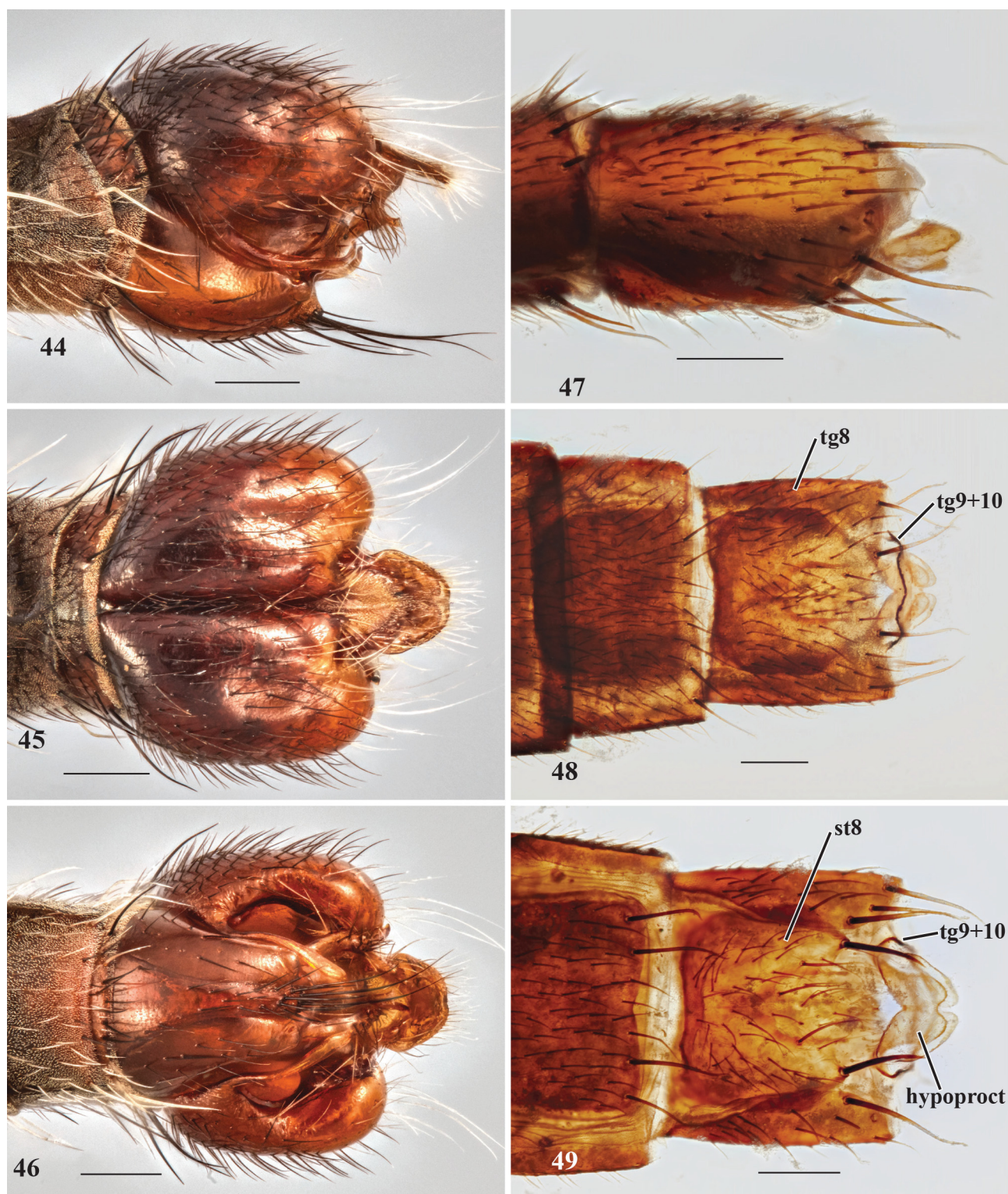
**Type material.** **HOLOTYPE** ♂, AUSTRALIA. **Queensland.** 1 ♂, Murrays Spring, 7 km W Musselbrook Resource Centre Lawn Hill Nat. Pk, 200 m 1835°15'S 13804°28'E 10.iv.1995 G. Daniels M.A. Schneider (QM Reg. No. T207014). **PARATYPES.** **Queensland.** 1 ♂, 1813.9°Sx1385.3°E Elizabeth Ck, Boodjamulla NP 18–22.iv.2005 12398 M. Mathieson, G. Smith. 170 m bloodwood open for, malaise (QM); 1 ♂, same data as holotype except 13.iv.1995 (QM); 1 ♀, same data as holotype except 21.iv.1995 mv lamp (QM); 3 ♂, 1 ♀, Ridgepole Waterhole, 24 km ESE of Musselbrook Resource Centre, Lawn Hill Nat. Pk, 1840°15'S 13822°15'E 2–9.iv.1995 180 m G. Daniels M.A. Schneider (QM).

**Non-type material examined.** 1 ♂, 1 ♀, 2053°SX13927°E Sybella Creek, 400m 17–22.iii.2001 malaise D.C. Darling, 50584 (QM); 8 ♂, 3 ♀, 22.969°S x 146.379°E Cudmore NP (CM3M) 351m. 28.x.2010–2.viii.2011 Lambkin, Starick & Bailey. *Melaleuca* heath nr drying creek. Malaise. 18517 T224535–7 (QM).

**Description.** **Male.** Body length, 5.9–7.9 mm; thoracic length, 1.5–1.9 mm; wing length, 4.4–5.5 mm. **Head.** Face gently rounded, barely protruding beyond eyes in profile and with silvery-white tomentum. Mystax with two vertical rows of long thin bristles, the uppermost 2 pairs black, remainder white and a medial row of stouter, white bristles; ventrally admixed with smaller weaker white setae on lower half of face and epistomal margin. Ocellar tubercle with a pair of long erect setae and a few smaller proclinate setae anteriorly. Occiput with several long black setae dorsally, weakening and becoming white ventrally. Beard with branched hairs. Flagellum about half as long as pedicel and subspherical or conical. Style with setae in two ranks. **Thorax.** Ground colour black, lateral pleural sclerites with fine grey tomentum; mesonotum with brownish tomentum, becoming silver-grey laterally; postpronotal lobe with a shining black area posteriorly. Acrostichal setae seemingly absent but visible when viewed in profile. Postpronotal lobe with a few long, weak, whitish setae. Presutural dorsocentral bristles absent; 2 or 3 pairs of postsutural dorsocentral bristles present. Scutellum dorsally with sparse, scattered setae and 2 long marginal bristles. Anepisternum bare, rarely with weak setae posteriorly. Anepimeral seta present. Katatergite with a vertical row of long, pale yellowish bristles, which are aligned with a similar row on the metanepisternum. **Wing** (Fig. 112). With microtrichia uniformly distributed over most of wing, basal half with clear areas in some cells. Costal bulge absent. Vein R4+5 not fused basally to vein R3. Vein M1 sub-parallel with vein R5. **Legs.** Femora black, narrowly orange-brown at apex. Fore and mid tibiae yellow-brown, brown-black apically; hind tibia yellow-brown, gradually becoming brown-black from about apical third, except ventrally where the darkening begins

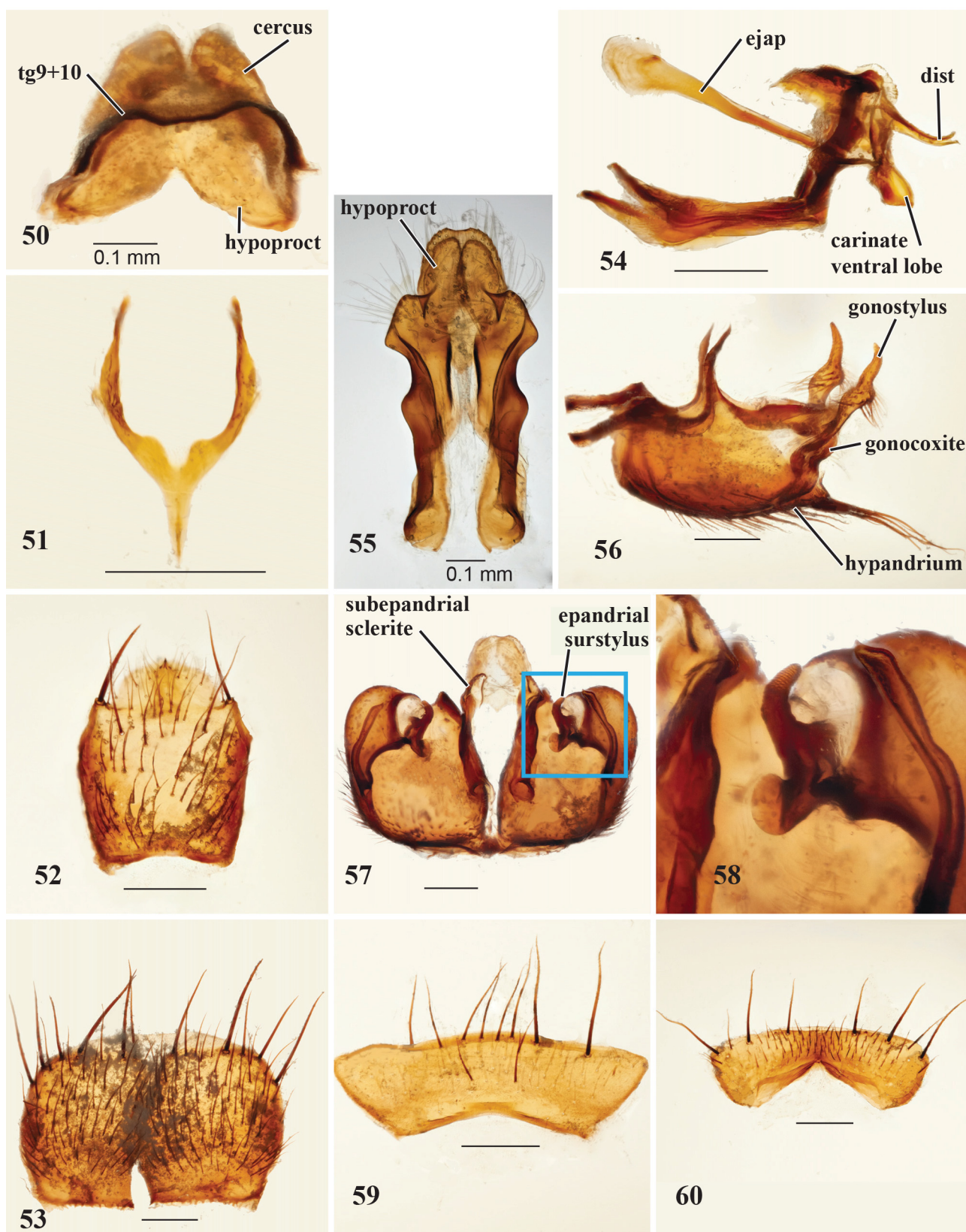


nearer to the middle. Fore and mid basitarsi yellow-brown, hind basitarsus brown-black, yellow-brown basally; remaining tarsal segments brown-black. Fore femur without stout bristles, a short, black anterior bristle sometimes present near middle of femur; ventrally with a row of 5 or 6 long, weak, pale coloured bristles. Mid femur with 2 anterior bristles, one about mid-point, the other about apical fourth; a downwardly directed anteroventral bristle at about middle of femur and several long fine pale ventral bristles. Hind femur with a black subapical dorsal bristle,



**FIGURES 44–49.** *Ommatius imaginis* sp. nov. (44–46). Male terminalia. (44). Lateral view; (45). Dorsal view; (46). Ventral view. (47–49) Female terminalia. (47). Lateral view; (48). Dorsal view; (49). Ventral view. Abbreviations: st, sternite; tg, tergite. Scale bar, 0.25 mm.





**FIGURES 50–60.** *Ommatius imaginis* sp. nov. (50–53). Female terminalia. (50). Tergite 9+10 and cerci; (51). Genital fork; (52). Sternite 8; (53). Tergite 8. (54–60). Male terminalia. (54). Aedeagal complex; (55). Subepandrial sclerite, ventral view; (56). Hypandrium, gonocoxite and gonostylus; (57). Epandrium, subepandrial sclerite and cerci, ventral view; (58). Enlargement of fig. 57 showing epandrial surstylus; (59). Sternite 8; (60). Tergite 8. Abbreviations: dist, distiphallus; ejap, ejaculatory apodeme; tg, tergite. Scale bar, 0.25 mm.

a pale anterior bristle at about midpoint, an anteroventral row of 5–7 short, stout bristles which are about as long as thickness of femur and a posteroventral row of 5 or 6 long, weak, pale coloured bristles which are about as long as thickness of femur. Fore tibia posteroventrally with 2 long, weak, pale coloured bristles equally spaced along tibia; 2 long, dark ventral bristles between posteroventral bristles; several stouter and shorter bristles around apex. Mid tibia with a long black anteroventral bristle at about basal third; a similar dorsal bristle at about apical third; ventrally with 2 long, weak, pale coloured bristles equally spaced along tibia and a shorter, stouter, black bristle at apical fourth. Hind tibia with 2 pale anteroventral bristles at about middle and apical fourth; a black, anteriorly directed anterodorsal bristle at apical third; an anteriorly directed dorsal bristle at apical fourth and subbasally. **Abdomen.** Greyish tomentose, segments 2–5 with a brownish central tomentose area which increases in size with each successive tergite, eventually covering most of tergite; segments 2–8 pale tomentose on posterior margin; and usually with 2 pale posterolateral submarginal bristles. Sternites with pale, semi-erect setae; distal margin of sternite 7 with 2–6 of long bristles. **Terminalia** (Figs 44–46, 54–60). Orange-brown, contrasting with tergites. Tergite 8 (Fig. 60) greyish tomentose; laterally about half as wide as tergite 7, deeply emarginate anterior margin, medially less than half the lateral length, pale brownish with about 8 long, stout, black bristles along distal margin. Sternite 8 (Fig. 59) greyish tomentose; broad and narrow, posterior margin about four times length; anterior margin about half as wide as posterior margin; posterior margin with several long black bristles. Cerci (Figs 44, 45) protruding well beyond epandrium. Epandrium (Fig. 44, 57, 58) rounded distally and covered with short, black setae; with a narrow, posteriorly directed ventral prong which bears a fine seta near its apex; ventrally with an inner dorsal lobe bearing a strongly hooked thumb-like surstylus (Figs. 57, 58), its distal lobe corrugate ventrally. Subepandrial sclerite (Fig. 55) strongly sclerotized on lateral margins, extending from about middle of epandrium to about middle of hypoproct. Hypandrium and gonocoxite (Figs 44, 46, 56) basally fused, with short, black setae; subequal in length; hypandrium narrow, apically with 4–6 long, black bristles. Gonostylus (Fig. 56) long and narrow, a swollen area mid-length bearing numerous, stout black setae. Aedeagal complex (Fig. 54) with subapically bowed distiphallus; basiphallus disto-ventrally with a carinate process; ejaculatory apodeme about as long as ventral aedeagal apodeme.

**Female.** Differs from male as follows: Body length, 6.6–9.0 mm; thoracic length, 1.7–2.3 mm; wing length, 5.0–6.5 mm. **Abdomen.** Sternite 7 with a row of 4–6 long stout bristles on distal margin. **Terminalia** (Figs 47–49). Tergite 8 (Figs 48, 53) with 6–10 long, black, stout bristles along somewhat rounded posterior margin. Sternite 8 (Figs 49, 52) slightly longer than broad and with a small, apical, medial carina; posterolaterally with a weakly, raised lobe bearing a stout, black bristle. Tergite 9+10 (Figs 48–50) heavily sclerotized, narrow dorsally, widening slightly laterally then becoming narrower again. Hypoproct (Figs 47, 49, 50) long and fused for most of its length, deeply emarginate anteriorly, less so posteriorly. Genital fork (Fig. 51) anteriorly with long apodeme and deeply emarginate between the bases of the arms.

**Etymology.** Derived from the Latin, *imago*, ‘likeness’, referring to the similarity between this species and *O. musselbrookensis* **sp. nov.**

**Distribution** (Fig. 8). North-western to central-eastern Qld. The distribution is sympatric with *O. musselbrookensis* **sp. nov.** in the northern part of the range of *O. imago* **sp. nov.**

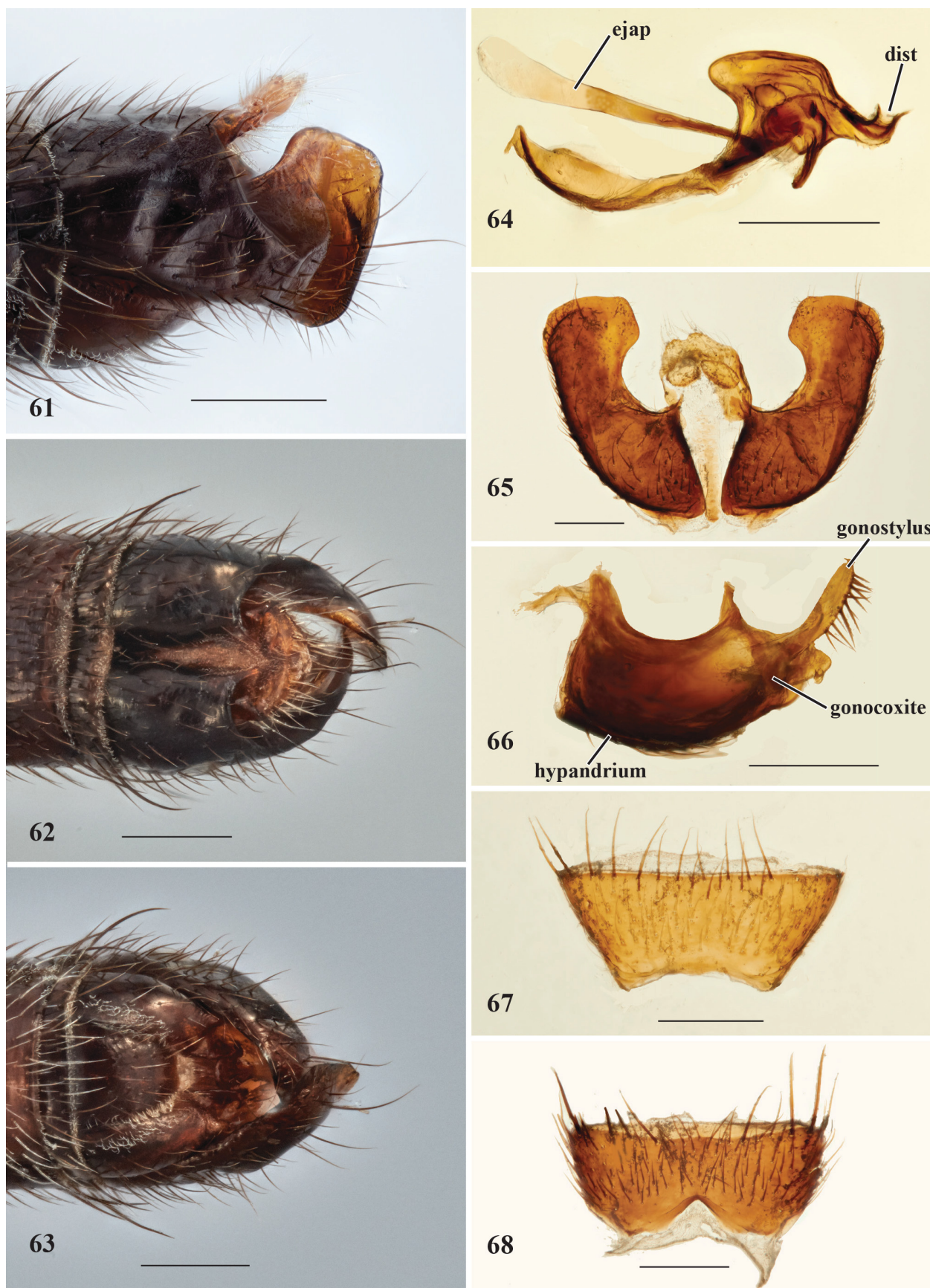
***Ommatius limbatus* sp. nov.**  
(Figs 9, 61–68, 113)

**Diagnosis.** Distinguished by the lack of marginal scutellar setae. Additionally, males have a dorsal flange on apical half of the epandrium.

**Type material.** **HOLOTYPE** ♂, AUSTRALIA. **Queensland.** 19°07.8’S 145°20.2’E / Gregory Development Rd, / 14 km NW Clarke Riv. 394 m / 17 Dec 2006–15 Feb 2007 / S. Wright. malaise, 14734 / vinescrub on limestone (QM Reg. No. T207015). **PARATYPES.** **Queensland.** 1 ♂, same data as holotype (QM); 1 ♂, -21.688°Sx146.924°E Nairana NP (NR1M). 254m. 25.x.–10.xi.2010. 18491 Lambkin, Starick, H. & D. Hanrahan. Open Eucalypt Woodld/spinifex. Malaise. T228471, (QM).

**Non-type material examined.** **Queensland.** 1 ♀ [abdomen damaged], 19°07.8’S 145°20.2’E / Gregory Development Rd, / 14 km NW Clarke Riv. 394 m / 17 Dec 2006–15 Feb 2007 / S. Wright. malaise, 14734 / vinescrub on limestone (QM).





**FIGURES 61–68.** *Ommatius limbatus* sp. nov. Male terminalia. (61). Lateral view; (62). Dorsal view; (63). Ventral view. (64). Aedeagal complex; (65). Epandrium ventral view; (66). Gonostylus, gonocoxite and hypandrium; (67). Sternite 8; (68). Tergite 8. Abbreviations: dist, distiphallus; ejap, ejaculatory apodeme Scale bar, 0.25 mm.



**Description. Male.** Body length, 5.4–5.9 mm; thoracic length, 1.5 mm; wing length, 4.0–4.2 mm. **Head.** Face gently rounded, barely protruding beyond eyes in profile and with silvery-white tomentum. Mystax with two vertical rows of long thin bristles, the uppermost 2 or 3 pairs black, remainder white; lower half of face and epistomal margin with weaker white setae. Ocellar tubercle with a pair of long erect or proclinate setae and a few shorter proclinate setae anteriorly. Occiput with several long black setae dorsally, weakening and becoming white ventrally. Flagellum about half as long as pedicel and conical. Style with setae in two ranks. **Thorax.** Ground-colour black, lateral pleural sclerites with fine grey tomentum; mesonotum with brownish tomentum, becoming silver-grey laterally; postpronotal lobe shining and covered with very fine tomentum and with a few long weak, whitish setae. Acrostichal setae seemingly absent but when viewed in profile setae are visible. Presutural dorsocentral bristles absent; 2 or 3 pairs of post-sutural dorsocentral bristles present. Scutellum dorsally with sparse scattered setae and a pair of weak marginal bristles. Anepisternum bare, rarely with weak setae posteriorly. Anepimeral seta present. **Wing** (Fig. 113). With microtrichia uniformly distributed over most of wing, basal third with some cells with clear areas. Costal bulge absent. Vein R4+5 arising almost perpendicular to vein R3. **Legs.** Femora black, narrowly orange-brown at apex. Tibiae orange-brown, darker apically, hind tibia dark brown-black on apical half. Fore and mid metatarsi orange-brown, hind metatarsus brown-black; remainder of tarsal segments brown-black. Fore femur with a ventral row of long, weak setae. Mid femur with an anterior bristle at about middle and another at apical third; a posteroventral row of 4 or 5 weak bristles and a ventral row of weak bristles. Hind femur with an anterior bristle at about middle and another at apical third; an ventral row of 4 or 5 short, stout bristles and a posteroventral row of 7 or 8 long fine bristles. Fore tibia with 2 long posteroventral setae; a short subbasal dorsal seta; a ventral row of 6 or 7 setae. Mid tibia with a stout anterodorsal bristle at about apical fourth, a similar anteroventral bristle at about basal third, a ventral seta at about apical third and a row of 4 or 5 short ventral setae. Hind tibiae with a subapical, anterodorsal bristle and another longer one at apical third; a posterodorsal bristle at about middle; 2 anteroventral bristles, one near the middle the other at apical fourth. **Abdomen.** Deep brown to black, with similarly coloured tomentum, tergites 2–7 narrowly greyish tomentose basally and apically, posterolateral bristles tergites 2–6 pale and thin and becoming weaker on each successive tergite; sternites deep brown to black, with pale, semi-erect setae. **Terminalia** (Figs 61–68). Deep brown to black, uniformly covered with fine setae. Tergite 8 (Fig. 68) with a slightly concave posterior margin and a deeply emarginate anterior margin; posterior margin with several long, stout bristles. Sternite 8 (Fig. 67) with straight posterior margin and concave anterior margin; posterior margin about half length of anterior margin. Epandrium (Fig. 65) not fused; distally with a dorsal flange-like process. Hypandrium and gonocoxite (Fig. 66) fused at base; gonocoxite incurved and upturned distally and with a large, dorsal apodeme just beyond middle; hypandrium tongue-like with a broad base, marginally with a dense fringe of short setae along length. Gonostylus (Fig. 66) attenuate, with short, stout bristles ventrally along distal half. Aedeagal complex (Fig. 64): distiphallus short and stout, dorsally upturned apically; basiphallus with a large, dorsal hood anteriorly and distally with a ventral prong; ventral aedeagal apodeme gently curved.

**Female.** Differs from male as follows: thoracic length, 1.6–1.8 mm; wing length, 5.2–5.6 mm. **Abdomen.** Damaged.

**Etymology.** The specific name is derived from the Latin *limbatus*, ‘bordered’, referring to the flange-like rim on the male epandrium.

**Distribution** (Fig. 9). Central-eastern Qld.

### ***Ommatius melasmus* sp. nov.**

(Figs 6, 69–84, 114)

**Diagnosis.** Immediately recognised by the black spot on the hind femur. The femoral pattern of *O. melasmus* is similar to *O. flavicaudus* Malloch but the latter species is larger, lacks an anepimeral bristle and has a spatulate apical extension on the epandrium.

**Type material.** **HOLOTYPE** ♂, AUSTRALIA. **Queensland.** GDCB Reg. / #19922 // meadow, NW of Mahogany / Forest, approx. 15.5 km NE / Rangers Stn, Mt Moffatt // Sect., Carnarvon Nat. Pk, / Qld 2454'59"S 14803'37"E / 23 November 2005 / G. Daniels 1180 m / (AM Reg. No. K349466). **PARATYPES.** **Queensland.** 1

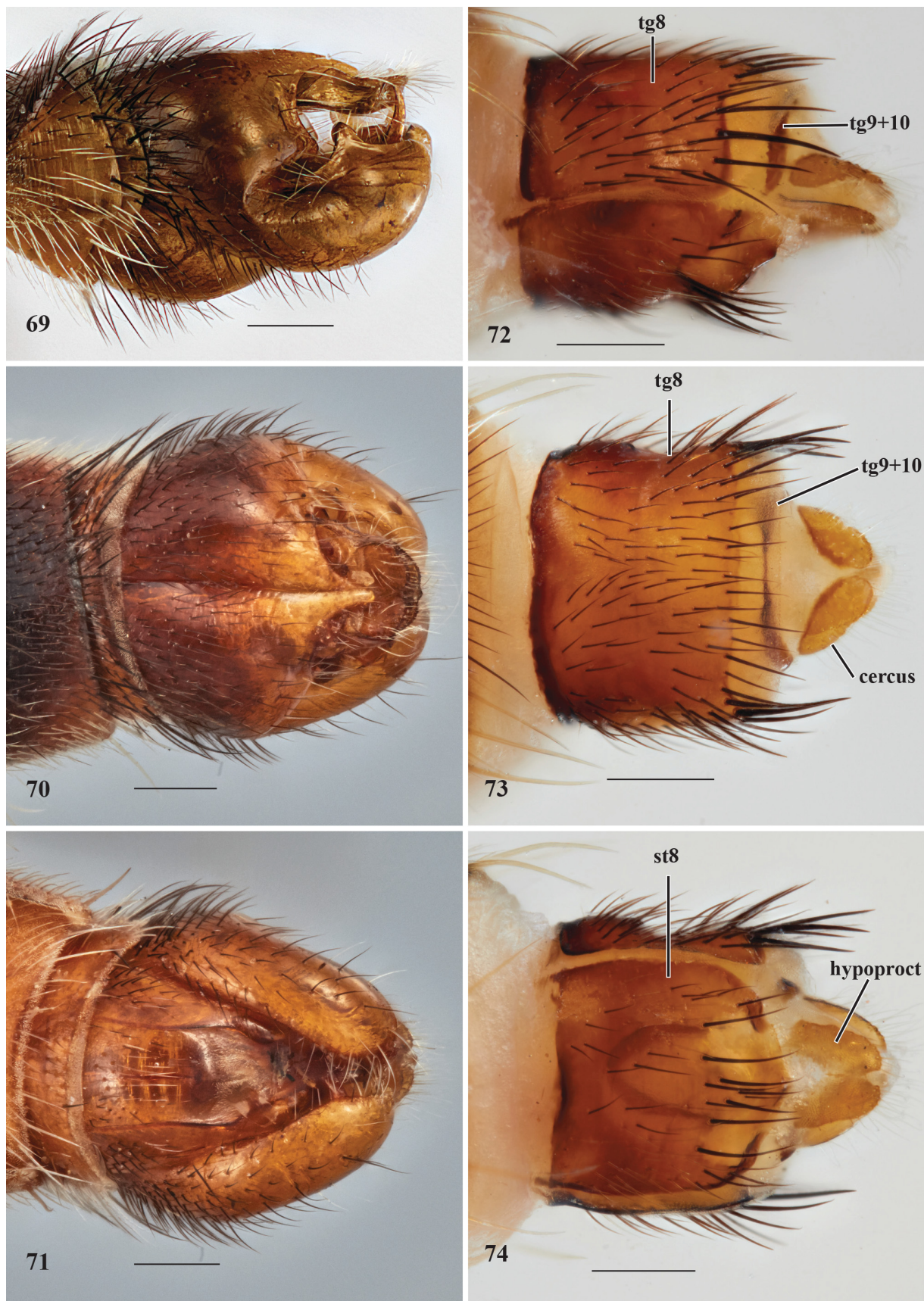
♂, 24.887°Sx147.445°E Carnarvon Stn, Ka Ka Mundi Rd. 693 m 10–15.x.2014. Flowering Budgeroo, C. Lambkin. Malaise T229930 in37257 (QM); 3 ♂, 24.857°Sx147.528°E White Stallion Spring, Carnarvon Stn. malaise. 680m, 3–4.x.2013. Wright. 36155 flowering *Melaleuca* at spring (QM); 1 ♂, 24.857°Sx147.527°E Carnarvon Stn, White Stallion Spr. 682 m. Malaise 10–15.x.2014 Dry reedy creek bed. Lambkin and Starick T229933 in37242 (QM); 4 ♂, 1 ♀, 24.837°Sx147.632°E Carnarvon Station (CN3M1). 690 m 14.xii.2010–15.v.2011 Zwick & Wilson. Malaise trap *Callitris* stand edge nr damp area with forbs. 19432 T228407–11 (QM); 9 ♂, 1 ♀, same data except 25.xi.–14.xii.2010 690m C. Zwick. 19423 T228428–37 (QM); 1 ♀, 24.946°Sx147.957°E Marlong Plain, Mt Moffatt NP 25–27.ix.2013. S.G. Wright. malaise. 780m grassland, nr creek 36150 (QM); 2 ♂, 2 ♀, 25.018°Sx147.895°E Carnarvon NP, nr Marlong Arch (MM2M). 714m 4–13.xi.2010. 19397 Lambkin et al. Malaise. *Callitris* in flowering heath. T228404 (QM); 2 ♂, 1 ♀, 25.020°Sx147.930°E Carnarvon NP, Mt Moffatt sect. nr HQ (MM3M). 13.xi.–13.xii.2010. 765m Reeves, Sternberg & Spinaze Malaise trap. 19403 *Callitris* in flowering heath. T228426–7 (QM); 1 ♂, 3 ♀, 2401°S 14747°E SCQ Mt Moffatt Nat. Pk Park Headquarters 25.xi.1995, 740 m. C.J. Burwell (QM); 2 ♀, Ranger's Stn, Mt Moffatt Sect., Carnarvon Nat. Pk, 2501°06'S 14757°08'E 23.xi.1999 G. Daniels 720 m malaise trap (AM); 1 ♂, same data except 24.xi.2005 malaise trap (AM); 1 ♂, same data except 20.xi.2005 *Eucalyptus populnea* woodland, on grass (AM); 2 ♂, 2404°39'S 14800°30'E Mt Moffatt Nat. Pk, 3 km SE Park Headquarters 20.xi.1995, 740 m. SCQ C.J. Burwell (QM); 1 ♂, 25.0447°S 147.9038°E Carnarvon NP, Mt Moffatt sect. Landing Ground Rd (MM12). 19–26.ix.2012. 690 m. Lambkin, Starick & Wright. Sandy gully. Malaise 19483 (QM); 1 ♂, 2404°54'S 14730°37'E Mt Moffatt Nat. Pk, SCQ base of the Tombs 19.xi.1995, 700 m Irwin, Gaimari, Yeates, Burwell. Malaise (QM); 2 ♂, 1 ♀, 2452°26'S 14801°19'E Mt Moffatt Nat. Pk, SCQ Kennifs Cave, 840 m 22.xi.1995 C.J. Burwell (QM); 3 ♂, 24.923°Sx148.008°E Carnarvon NP, Mt Moffatt sect nr Kennifs Lkt (MM1M). 13.xi.–13.xii.2010 859m Reeves, Sternberg, Spinaze Malaise trap. 19395 open *Eucalyptus* woodland T228412–3, T228466 (QM); 3 ♀, West Branch Camp, Mt Moffatt Sect., Carnarvon Nat. Pk, 2458°32 S 14800°52'E 23.xi.1999 800 m G. Daniels (AM); 2 ♀, same data except on low Compositae (AM); 1 ♀, same data except 21.xi.2005 on tall grass (AM); 1 ♀, same data except on *Xanthorrhoea* leaf (AM); 1 ♂, 1 ♀, same data except 26.xii.2005 (AM); 2 ♂, 2504°S 14802°E One Mile Ck, Mt Moffatt Nat. Pk. 2.xii.1997 C. Lambkin, S. Evans, J. Skevington (QM); 2 ♀, One Mile Ck, 1 km WSW Mt Moffatt, Mt Moffatt Sect., Carnarvon Nat. Pk, 2503°49'S 14801°57'E 27–29.xi.1999 G. Daniels (AM); 1 ♂, 3 ♀, same data except 2501°06'S 14757°08'E 21.xi.2005 840 m on long grass (AM); 1 ♂, 3 ♀, nr Mt Moffatt, Mt Moffatt Sect., Carnarvon Nat. Pk, 2503°49'S 14801°57'E 1.xii.1999 G. Daniels malaise (AM); 1 ♀, Top Moffatt Camp, Mt Moffatt Sect., Carnarvon Nat. Pk, 2504°08'S 14803°03'E 25.xi.1999 G. Daniels mv lamp (AM); 1 ♂, 25.0672°Sx148.0519°E Mt Moffatt NP, top Moffatt camp (MM23). 18275 730m. 25.ix.2012. Lambkin, Wright, Starick. Hand net. (QM);

**Non-type material.** Qld: 1 ♂, Davies Ck Nat. Pk nr Mareeba, 16°56'S 145°32'E 6.i.1992 L. Ring (AM); 1 ♂, 17°20'S 145°25'E Baldy Mtn Rd, 2.4 km from S. end 1130 m 1.xii.1997 C.J. Burwell (QM); 2 ♂, 4 ♀, Bluewater S.F. NW of Townsville, 19°14'18"S 146°24'E 13–14.i.1995 G. and A. Daniels 580 m (AM); 2 ♂, same data except 14.i.1995 mv lamp (AM); 1 ♂, 21.687°Sx146.924°E Nairana NP (NR1M) 10.xi.–7.xii.2010. 245 m R. Raven, H. & D. Hanrahan Malaise trap T224575 in18493 open euc wldnd+ spinifex. (QM); 1 ♂, 22°39.5'Sx148°01.0'E Lords Table plateau, site 2 10.i.–7.iii.2006 Burwell eucalypt woodland. 460 m malaise 13373 (QM); 4 ♂, 22°40.5'Sx148°01.2'E Lords Table, SE base, site 2 13.i.–4.iii.2006 13362 C.J. Burwell malaise 640 m eucalypt woodland (QM); 1 ♀, 23°12'Sx149°45'E Boomer Ra, site 2 180 m 28–30.ix.1999, 7778 S. Evans, C.J. Burwell OF (QM); 1 ♂, Mt Archer nr Rockhampton, 23°20'S 150°59'E 25.xii.1993 G. and A. Daniels R. Eastwood (AM); 6 ♂, 8 ♀, 23.537°Sx151.725°E Masthead Island, site 5. 5–7.x.2008. 17186 QM/QPWS. Malaise 0–5 m. Beach, in *Spinifex*. (QM); 1 ♀, 23°56'49"S151°21'13"E Boyne Is, (CAS-1) 21.i.1995 DIP Grass sweep (QM); 2 ♂, 1 ♀, 23.860°Sx148.157°E Goonderoo NR. (GNR1M) 31.x.–8.xii.2010.262m. Lambkin, Starick & Raven. Malaise trap. 18537 Closed euc/*Acacia* woodld. T228414–16 (QM); 5 ♂, 5 ♀, 24.440°Sx148.458°E Albinia NP (ANP1M) 31.x.–17.xi.2010. 226 m Lambkin, Starick & Spooner. Malaise trap. 18540 *Melaleuca* in grassland T228438–47 (QM); 3 ♂, 3 ♀, same data except 17.xi.–15.xii.2010. B. Spooner *Melaleuca* in grassld. Malaise. 19344 T228417–23 (QM); 1 ♂, same data except 24.441°Sx148.459°E 15.xii.2010–4.ii.2011. B. Spooner. *Melaleuca* stand/ grassland. Malaise. 19461 T228424 (QM); 1 ♂, 2 ♀, SEQ: 25°12's 148°59'E Expedition Range NP. 'Amphitheatre' camp 560 m 18.xii.1997 Evans Burwell, open forest (QM); 1 ♂, 28 km W of Eidsvold, 25°25'S 150°53'E 17.i.1991 G. and A. Daniels (AM); 1 ♀, 25°25'S 150°01'E Taroom District Boggomos 19 11.xi.1996 C.J. Burwell S. Evans 131 (QM); 2 ♀, 25°27'S 150°02'E Taroom District Boggomos 8 12.xii.1996 C.J. Burwell S.



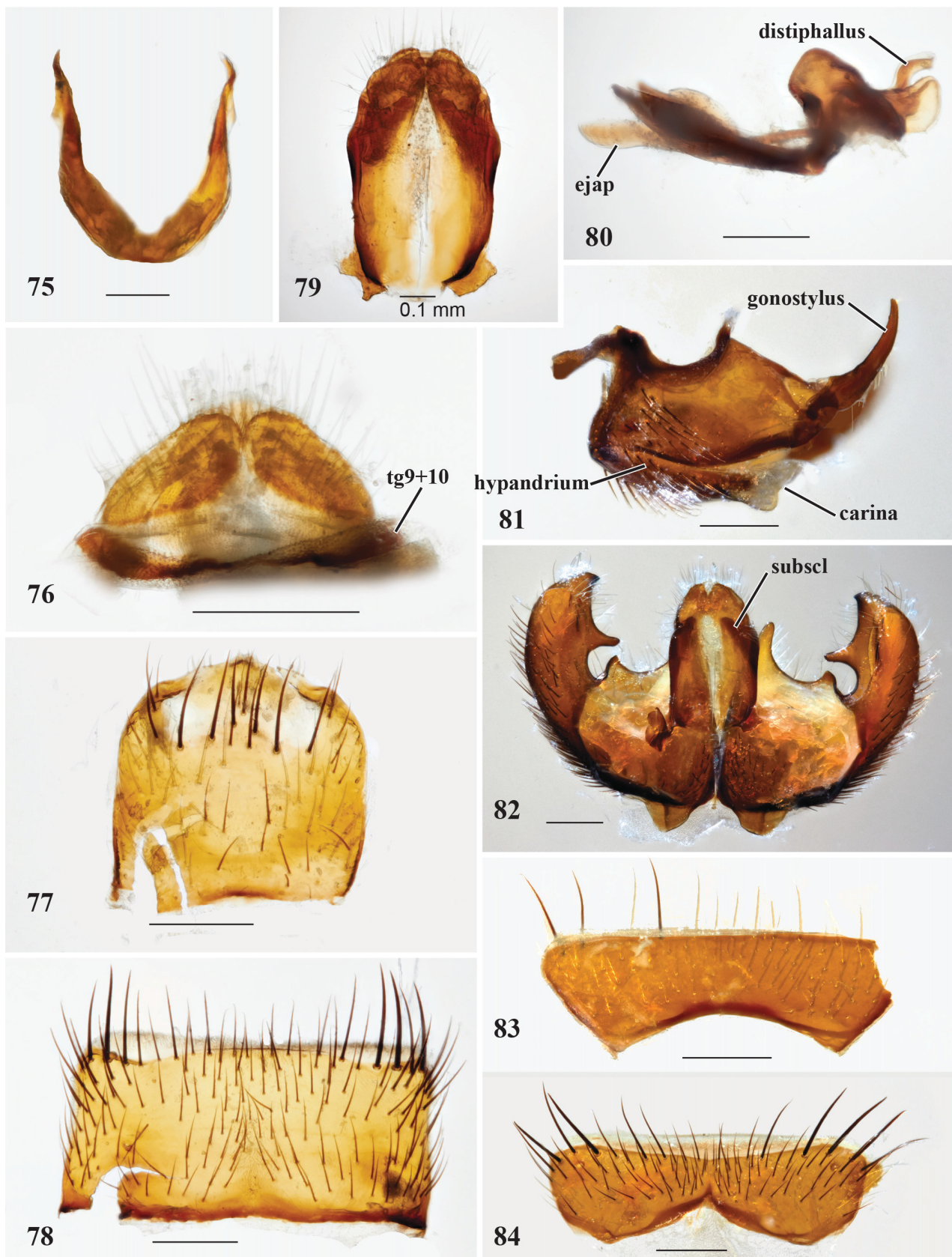
Evans 137 (QM); 1 ♀, 25.490°Sx148.832°E Lonesome NP nr Picnic area (LNP5M). 388 m. 19384 3–26.xi.2010 Malaise Trap C. Lambkin et al. Closed euc/*Eremophila* woodland on rocky hill. T228406 in19384 (QM); 1 ♂, same data except 26.xi.2010–11.i.2011. D. Beard & B. Sigley. Malaise T228425 19386 (QM); 1 ♂, rain forest margin, Teddington Weir SE of Maryborough, 25°39'S 152°40'E 12.xi.1989 G. and A. Daniels (AM); 4 ♂, 1 ♀, nr Teddington Weir SE of Maryborough, 25°39'S 152°40'E 25.ix.1994 G. and A. Daniels C.J. Burwell (AM); 1 ♂, same data except 24.ix.1994 mv lamp (AM); 2 ♂, nr Teddington Weir SE of Maryborough 25°39'S 152°40'E 13.xi.1994 G. and A. Daniels vine forest margin (AM); 1 ♂, Sandy Ck S of Maryborough, 25°40'S152°41'E 23.ii.1986 G. and A. Daniels (AM); 1 ♂, 1 ♀, 26.026°S 151.184°E Allies Ck (Hwy), 400m, RF 6.ii.–3.iv.2014 G. Monteith, Malaise trap 25500 (QM); 1 ♀, 26.239S 151.679E Mt McEuen Rd, 540 m OF, 1–30.x.2013 G. Monteith, Malaise traps 35610 (QM); 1 ♂, The Beacon, Imbil St. For., 26°30'S 152°35'E 29.xii.1990 G. and A. Daniels (AM); 1 ♂, 2 km ENE of Sunday Ck Environ. Studies Centre, Jimna St. For., 26°42'12"S 152°33'42"E 4.iii.1995 850 m G. Daniels C.J. Burwell (AM); 2 ♂, Samsonvale Cemetery, 8.5 km SSE Dayboro, SEQ 27°16'S 152°52'E 10.xi.1995, C.J. Burwell (QM); 1 ♀, Mt Glorious; Scrub Creek Road; Brisbane Forest Park; 27°25'S 152°50'E 1.xi.1998; J. & A. Skevington (QM); 1 ♂, Brisbane .i.1962 J.H. Bryan UQIC7787 (QM); 1 ♂, same data except 3.x.1976 R. Brieze-Stegman UQIC7335 (QM); 1 ♂, same data except 16.ii.[19]60 Haseler UQIC7334 (QM); 1 ♀, 27.535°Sx 153.248°E Redlands, Hilliards Ck, nr Weippin Rd (RHC2) 204 m 21.xi.2008 QM Party. day hand collected 17408 heath/scrubby gum forest (QM); 1 ♂, Moggill 4.ii.[19]58 H.G. Greening UQIC7333 (QM); 1 ♂, Sumner, Brisbane, 27°33'52"S 152°55'51"E 24.xi.2007 20 m urban G. Daniels (AM); 2 ♂, same data except 27.i.2008 (AM); 1 ♀, same data except 21.ix.2008 (AM); 1 ♀, same data except 23.xii.2007 in plant house (AM); 1 ♀, same data except 6.i.2008 (AM); 1 ♂, 2 ♀, same data except 10–24.xii.2008 G. Daniels 20 m urban, on grass inflorescence (AM); 1 ♀, same data except 1.i.2009 (AM); 1 ♂, Leslie Dam nr Warwick, 28°13'S 151°55'E 27.i.1981 R. Eastwood (AM); 2 ♂, 2 ♀, same data except 12.ii.993 G. and A. Daniels (AM); 2 ♀, Teviot Brook, nr Wilson's Peak 28°13'S 153 [=152]°31'E 17–18.xi.1980 G. Daniels M.A. Schneider (QM); 1 ♂, 1 ♀, Wildash nr Warwick, 28°18'S 152°03'E 13.ii.1993 G. and A. Daniels (AM); 1 (abdomen missing), 3 km S Tamborine Vill., 5.iii.1980, H.E. & M.A. Evans & A. Hook (QM). NSW: 1 ♂, Tregeagle 10 km SE of Lismore 27.xi.1979 D. Yeates (AM); 1 ♂, 29.29°S 152.22°E Summit Mtn, Gibraltar Ra. NP, 1618.xii.1996. S. Winterton, C. Lambkin, D. Yeates, C. Palmer (QM); 1 ♀, Waratah Trig. track, Gibraltar Ra. NP, 29.30°S 152.20°E 16.xii.1996., malaise D. Yeates, C. Lambkin, S. Winterton, C. Palmer (QM); 1 ♀, Mt Kaputar NP, Bullawa Ck, malaise, 30°14'S 150°06'E 16–19.i.1994, M.E. Irwin, D.K. Yeates (QM); 6 ♂, 4 ♀, Mt Kaputar NP, Eulah Ck, malaise, 30°20'S 150°04'E 16–19.i.1994, M.E. Irwin, D.K. Yeates (QM); 1 ♀, Warrumbungle Natl. Park, Woolshed, Wambelong Ck 31.xx.1992 M.E. Irwin 6 m gray malaise trap in vegetated old channel of Wambelong Creek no standing water (AM).

**Description. Male.** Body length, 6.2–6.7 mm; thoracic length, 1.6–1.9 mm; wing length, 5.1–5.7 mm. **Head.** Face gently rounded, barely protruding beyond eyes in profile and with silvery-white tomentum. Mystax with two vertical rows of long thin black bristles admixed with smaller weaker setae on lower half of face and epistomal margin. Ocellar tubercle with a pair of long proclinate setae and a few smaller setae anteriorly. Occiput with several long black setae dorsally, weakening and becoming white ventrally. Beard with branched hairs. Flagellum about half as long as pedicel and often almost spherical. Style with setae in one rank on basal half, then two distally. **Thorax.** Black with grey tomentum on pleura. Mesonotum subshiny, dorsally with sparse mostly light brown-yellow tomentum; laterally with grey tomentum. Scutellum with grey tomentum. Acrostichal setae short and weak, only visible in profile. Presutural dorsocentral bristles absent. Postsutural dorsocentral bristles present as 2–4 pairs and with weak setae present anteriorly and posteriorly. Two long marginal scutellar bristles present and a few weak setae on disc. Anepisternum bare, rarely with weak setae posteriorly. Anepimeral seta present; anepimeron with a group of fine setae anterior to the anepimeral cleft. **Wing** (Fig. 114). With microtrichia extending posteriorly to cell cua1 and present as a small isolated area in the discal cell and cell m3 and not extending proximally beyond junction of veins R4 and R5; microtrichia absent from cell br, cell bm and cell cup. Costal bulge absent. Vein R4+5 not fused basally to vein R3. Vein M1 sub-parallel with vein R5. **Legs.** Yellowish; fore femur brown-black anteriorly and dorsally along length; mid femur similarly marked but dark stripe absent basally and apically; hind femur with a preapical anterodorsal brown-black spot which can extend around femur; tibiae brownish apically; basitarsi brownish apically, other segments brownish. Coxae with grey tomentum and white bristles. Fore femur without stout bristles, a short black anterior bristle sometimes present near middle of femur; ventrally with a row of 5 or 6 long, weak, pale coloured bristles. Fore tibia posteroventrally with 2 long, weak, pale coloured bristles equally spaced along tibia; 2 long, dark ventral bristles positioned between posteroventral bristles; several stouter



**FIGURES 69–74.** *Ommatius melasmus* sp. nov. (69–71). Male terminalia. (69). Lateral view; (70). Dorsal view; (71). Ventral view. (72–74) Female Terminalia. (72). Lateral view; (73). Dorsal view; (74). Ventral view. Abbreviations: st, sternite; tg, tergite. Scale bar, 0.25 mm.





**FIGURES 75–84.** *Ommatius melasmus* .sp. nov. (75–78). Female. (75). Genital fork; (76). Tergite 9+10, cerci; (77). Sternite 8; (78) Tergite 8. (79–84). Male. (79). Subepandrial sclerite, ventral view; (80). Aedeagal complex; (81). Gonocoxite, gonostylus, hypandrium; (82) Epandrium (ventral); (83). Sternite 8; (84) Tergite 8. Abbreviations: ejap ejaculatory apodeme; subscl, subepandrial sclerite; tg, tergite. Scale bar, 0.25 mm and as indicated.

and shorter bristles around apex. Mid femur with 2 anterior bristles, one about mid-point, the other about apical fourth; a downwardly directed anteroventral bristle at about middle of femur and several long fine pale ventral bristles. Mid tibia with a long black anteroventral bristle at about basal third; a similar dorsal bristle at about apical third; ventrally with 2 long, weak, pale coloured bristles equally spaced along tibia and a shorter, stouter, black bristle at apical fourth. Hind femur with a pale subapical dorsal bristle, a pale anterior bristle at about midpoint, ventrally with a row of 5 or 6 long, weak, pale coloured bristles which are a little stouter than those on fore femur. Hind tibia with 2 pale anteroventral bristles at about middle and apical fourth and 2 similarly positioned black dorsal bristles that are slightly inclined posteriorly; an anteriorly directed dorsal bristle at apical fourth and subbasally. **Abdomen.** Mostly brownish tomentose, segment one entirely and segments 2–7 grey tomentose on posterior margin and usually with a pale lateral marginal bristle; mostly pale setose laterally, black setose dorsally; tergite 7 with a small medial indentation on anterior margin; Sternites with pale, erect setae. **Terminalia** (Figs 69–71, 79–84) usually pale orange-brown, contrasting with nearby tergites. Tergite 8 (Fig. 84) with 6–8 black bristles on posterior margin and weaker posterolateral bristles; posterior margin weakly concave, anterior margin strongly emarginate. Sternite 8 (Fig. 83) with strongly concave anterior margin; posterior margin almost straight, with several long black bristles. Epandrium (Figs 70, 71, 82) black setose; with a deep dorsal cleft which gives the appearance of a deformity; dorsally with a pointed distal lobe, another rounded lobe just before cleft and another distal lobe on dorsal margin; apically inturned and pointed; broadly rounded ventrally. Gonocoxite and hypandrium (Fig. 81) basally fused; gonocoxite with a dorsal apodeme about middle of length; hypandrium with a small apical carina. Subepandrial sclerite (Fig. 79) well sclerotized laterally, becoming less sclerotized medially. Cerci short and broad. Aedeagal complex (Fig 80): distiphallus short and curved, arising dorsally from basiphallus; basiphallus long, with an anterior dorsal hood and a pair of distal, flange-like processes below distiphallus; ejaculatory apodeme arising from base of basiphallus as do ventral aedeagal apodemes.

**Female.** Differs from male as follows: Body length, 7.4–8.0 mm; thoracic length, 2.1 mm; wing length, 6.4–6.5 mm. **Abdomen.** Sternites 6 and 7 on posterior margin with 2 pairs of long, pale setae. **Terminalia** (Figs 72–78). Sternite 8 (Fig. 77) orange-brown with pale setae, becoming black distally; two weakly sclerotized submedial distal areas; a pair of short digitate posterolateral processes, slightly over-lapping membranous area. Tergite 8 (Fig. 78) usually orange-brown and about twice as wide as long; with 4 or 5 stout, black posterolateral marginal bristles; with a short medial carina on posterior margin and shallow medial sulcus across tergite (Fig 73). Tergite 9+10 (Figs 72, 73, 75) heavily sclerotized, narrowest dorsally, widening slightly laterally then becoming narrowing again. Hypoproct (Fig. 74) as long as cerci and fused posteriorly, posterior margin with a small, round indentation. Genital fork (Fig. 75) lacking anterior apodeme.

**Etymology.** Derived from the Greek, *melasma*, ‘a black spot’, referring to the black mark on the hind femur.

**Distribution** (Fig. 6). Widespread from northern Qld south into northern NSW.

### ***Ommatius musselbrookensis* sp. nov.**

(Figs 3, 5, 85–100, 115)

**Diagnosis.** This species is very similar in appearance to *O. imaginis* sp. nov. and the two species are sympatric in the north-western part of the distribution of *O. musselbrookensis* sp. nov. Males can be easily separated on terminalia and females by the shape and bristles on sternite 8. The extent of the yellow-brown area of the hind tibia can also help to separate females.

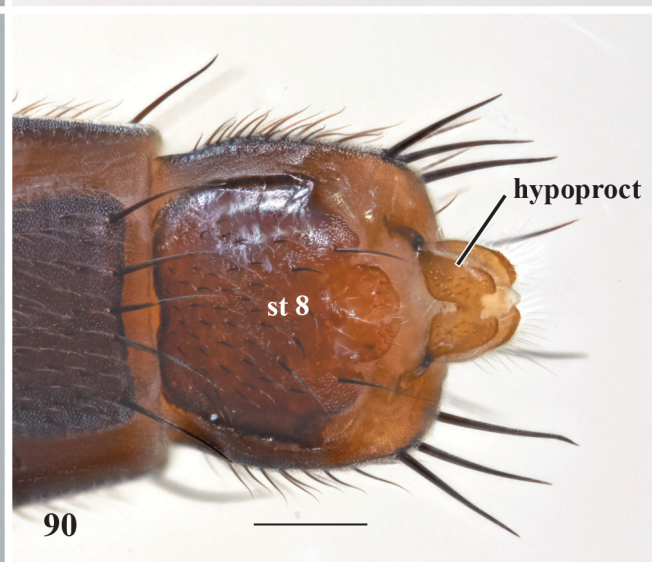
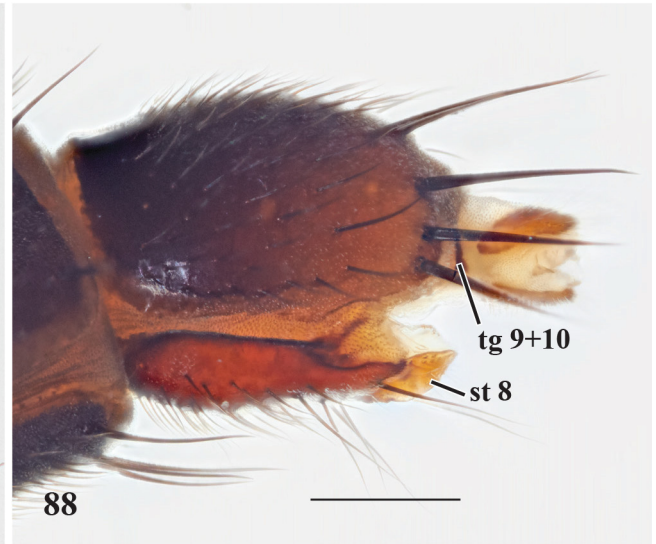
**Type material.** **HOLOTYPE** ♂, AUSTRALIA. **Queensland.** 1 ♂, Murrays Spring, 7 km W / Musselbrook Resource Centre / Lawn Hill Nat. Pk, Qld 200 m / 1835°15'S 13804°28'E / 21 April 1995 / G. Daniels M.A. Schneider / (QM Reg. No. T207016). **PARATYPES.** **Northern Territory.** 10 ♂, 6 ♀, Border Waterhole, 15 km W of Musselbrook Resource Centre Lawn Hill Nat. Pk, 1836°44'S 13759°30'E 19.iv.–6.v.1995 200 m G. Daniels M.A. Schneider (QM). **Queensland.** 2 ♂, 1813.9'Sx1385.3'E Elizabeth Ck, Boodjamulla NP 18–22.iv.2005 12398 M. Mathieson, G. Smith. 170 m bloodwood open for, malaise (QM); 19 ♂, 15 ♀, Murrays Spring, 7 km W Musselbrook Resource Centre Lawn Hill Nat. Pk, 200 m 1835°15'S 13804°28'E 21.iv.–14.v.1995 G. Daniels M.A. Schneider (QM); 3 ♂, 2 ♀, Musselbrook Ck, 11 km ENE Musselbrook Resource Centre Lawn Hill Nat. Pk, 140 m 1836°45'S 13807°46'E 8.v.1995 G. Daniels M.A. Schneider (QM); 1 ♂, 6 ♀, Musselbrook Ck, 19 km NE of Musselbrook Resource Centre Lawn Hill Nat. Pk, 1829°59'S 13817°01'E 30.iv.–11.v.1995 130 m G. Daniels M.A.



Schneider (QM); 1 ♂, 8 ♀, Holts Ck, 8 km NE Musselbrook Resource Centre Lawn Hill Nat. Pk, 1832°32'S 13811°06'E 10–14.v.1995 150 m G. Daniels M.A. Schneider (QM); 1 ♀, Stockyard Ck, 18 km NE of Musselbrook Resource Centre Lawn Hill Nat. Pk, 1826°44'S 13828°35'E 16.v.1995 120 m G. Daniels M.A. Schneider (QM); 1 ♂, 2 ♀, Amphitheatre waterhole area 27 km N Musselbrook Resource Centre, Lawn Hill Nat. Pk, 1821°08'S 13809°43'E 3–13.v.1995 200 m G. Daniels M.A. Schneider (QM); 1 ♀, Amphitheatre spring area 28 km N Musselbrook Resource Centre, Lawn Hill Nat. Pk, 1820°58'S 13811°09'E 4.v.1995 200 m G. Daniels M.A. Schneider (QM).

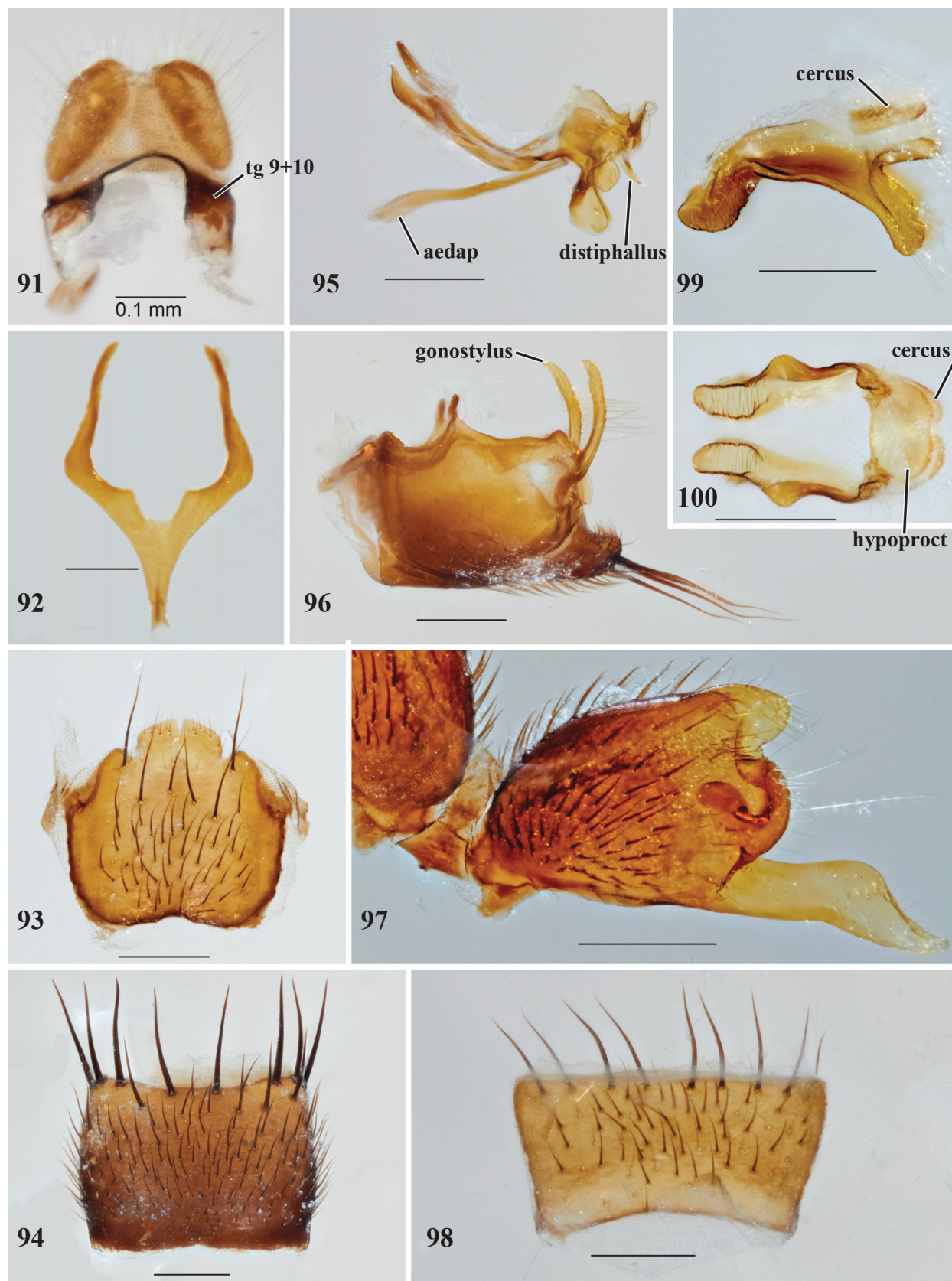
**Description. Male.** Body length, 7.0–7.6 mm; thoracic length, 1.7–2.0 mm; wing length, 5.0–5.6 mm. **Head.** Face gently rounded, barely protruding beyond eyes in profile and with silvery-white tomentum. Mystax with two vertical rows of long thin bristles, the uppermost 2 or 3 pairs black, remainder white and a medial row of stouter, white bristles; ventrally admixed with smaller weaker white setae on lower half of face and epistomal margin. Ocellar tubercle with a pair of long erect or proclinate setae and a few smaller proclinate setae anteriorly. Occiput with several long black setae dorsally, weakening and becoming white ventrally. Beard with branched hairs. Flagellum about half as long as pedicel and subspherical or conical. Style with setae in two ranks. **Thorax.** Ground colour black, mesonotum with brownish tomentum, becoming silver-grey laterally; postpronotal lobe with a shining black anterior area; lateral pleural sclerites with fine grey tomentum. Acrostichal setae seemingly absent but visible when viewed in profile. Postpronotal lobe with a few long weak, whitish setae. Presutural dorsocentral bristles absent; 2 or 3 pairs of postsutural dorsocentral bristles present. Scutellum dorsally with sparse, scattered setae and 2 long marginal bristles. Anepisternum bare, rarely with weak setae posteriorly. Anepimeral seta present. **Wing** (Fig. 115). Microtrichia uniformly distributed over most of wing, basal half with some cells with clear areas. Costal bulge absent. Vein R4+5 not fused basally to vein R3. Vein M1 sub-parallel with vein R5. **Legs.** Femora black, narrowly orange-brown at apex. Fore and mid tibiae yellow-brown, brown-black apically; hind tibia yellow-brown, gradually becoming brown-black from about apical third, except ventrally where the darkening begins almost at base. Fore and mid metatarsi yellow-brown, hind metatarsus brown-black; remainder of tarsal segments brown-black. Fore femur with an anterior bristle and a ventral row of long, weak setae. Mid femur with an anterior bristle at about middle and another at apical third; a posteroventral row of 4 or 5 weak bristles and a ventral row of weak bristles. Hind femur with a black subapical dorsal bristle, with a pale anterior bristle at about middle; an anteroventral row of 5–7 short, stout bristles which are about as long as thickness of femur and a posteroventral row of 7 or 8 long bristles which are at least 50% longer than thickness of femur. Fore tibia with 2 long posteroventral setae; a short subbasal dorsal seta; a ventral row of 6 or 7 setae. Mid tibia with a stout anterodorsal bristle at about apical fourth and a similar ventral seta at about apical third. Hind tibiae with a subapical, anterodorsal bristle and another longer one at apical third; a posterodorsal bristle at about middle; 2 anteroventral bristles, one near the middle the other at apical fourth. **Abdomen.** Mostly brownish tomentose, segment one entirely and segment 2 basally grey tomentose; segments 2–7 with pale tomentum on posterior margin; tergites 2–7 with pale posterolateral submarginal setae, becoming more obvious on each successive segment until extending around entire posterior margin; sternites with pale, semi-erect setae; apical margin of sternites 5–8 black setose. **Terminalia** (Figs 85–87, 95–100). Orange-brown, epandrium sometimes deep brown and contrasting with tergites. Tergite 8 pale brownish and narrow, about one-third as wide as segment 7; broad and narrow, posterior margin about four times length and anterior margin about half as wide as posterior margin; posterior margin with several long black bristles. Sternite 8 (Fig. 98) with posterior margin about twice as wide as long and with about eight long, stout, black bristles along posterior margin; anterior margin concave. Epandrium (Figs 85, 87, 97) ovoid, not fused, with a small dorsal apical lobe and a ventral, posteroventrally directed, semi-transparent, blade-like lobe; posterior margin with a C-shaped process on inner margin. Gonocoxite (Fig. 96) with a dorsal apodeme at about basal third; gonostylus long, vertical, with long setae at about middle. Hypandrium (Fig. 96) extending beyond gonocoxite, forming an apical knob from which arises a fan of about 4 long black bristles. Aedeagal complex (Fig. 95) with a short, dorsal distiphallus; basiphallus disto-ventrally with several ventral lobes; ejaculatory apodeme about as long as ventral aedeagal apodemes, which arise above mid-point of basiphallus. Subepandrial sclerite (Figs 99, 100) complex, ventrally with anterior and posterior lobes; anterior lobes rugose.

**Female.** Differs from male as follows: Body length, 7.0–9.0 mm; thoracic length, 1.6–2.2 mm; wing length, 5.0–6.5 mm. **Abdomen.** Sternites 2–6 with 2–6 erect subbasal bristles. **Terminalia** (Figs 88–94). Sternite 8 (Fig. 93) a little wider than long; distal margin with a small medial indentation and a larger submedial emargination bearing a long black bristle which arises near its base. Tergite 8 (Fig. 94) a little wider than long; posterior margin



**FIGURES 85–90.** *Ommatius musselbrookensis* sp. nov. (85–87) Male terminalia. (85). Lateral view; (86). Dorsal view; (87). Ventral view. (88–90) Female terminalia. (88). Lateral view; (89). Dorsal view; (90). Ventral view. Abbreviations: st, sternite; tg, tergite. Scale bar, 0.25 mm.





**FIGURES 91–100.** *Ommatius musselbrookensis* sp. nov. (91–94). Female. (91). Tergite 9+10, cerci; (92). Genital fork; (93). Sternite 8; (94) Tergite 8. (95–100). Male. (95). Aedeagal complex; (96). Gonocoxite, gonostylus, hypandrium. (97). Epandrium (ventral view), subepandrial sclerite removed; (98). Sternite 8; (99). Subepandrial sclerite, lateral view; (100). Subepandrial sclerite, ventral view; Abbreviations: aedap, aedeagal apodeme; st, sternite; tg, tergite. Scale bar, 0.25 mm and as indicated.

concave and with several long, stout bristles. Tergite 9+10 and cerci not retracted into segment 8. Tergite 9+10 (Fig. 91) thread-like dorsally, abruptly widening laterally before abruptly becoming thread-like again. Hypoproct (Fig. 90) as long as cerci and fused for most of length and with a posterior medial notch and a longer, narrower anterior notch. Genital fork (Fig. 92) proximally with long apodeme and deeply emarginate between the bases of the arms, broadest mid-length.

**Etymology.** The specific name is derived from the type locality.

**Distribution** (Fig. 5). Sympatric with *O. imaginis* **sp. nov.** Most specimens are known from west of Lawn Hill National Park in north-western Qld. A few specimens have been collected in the same general area but less than 1 km across the border in the NT.

### ***Ommatius radamnis* sp. nov.**

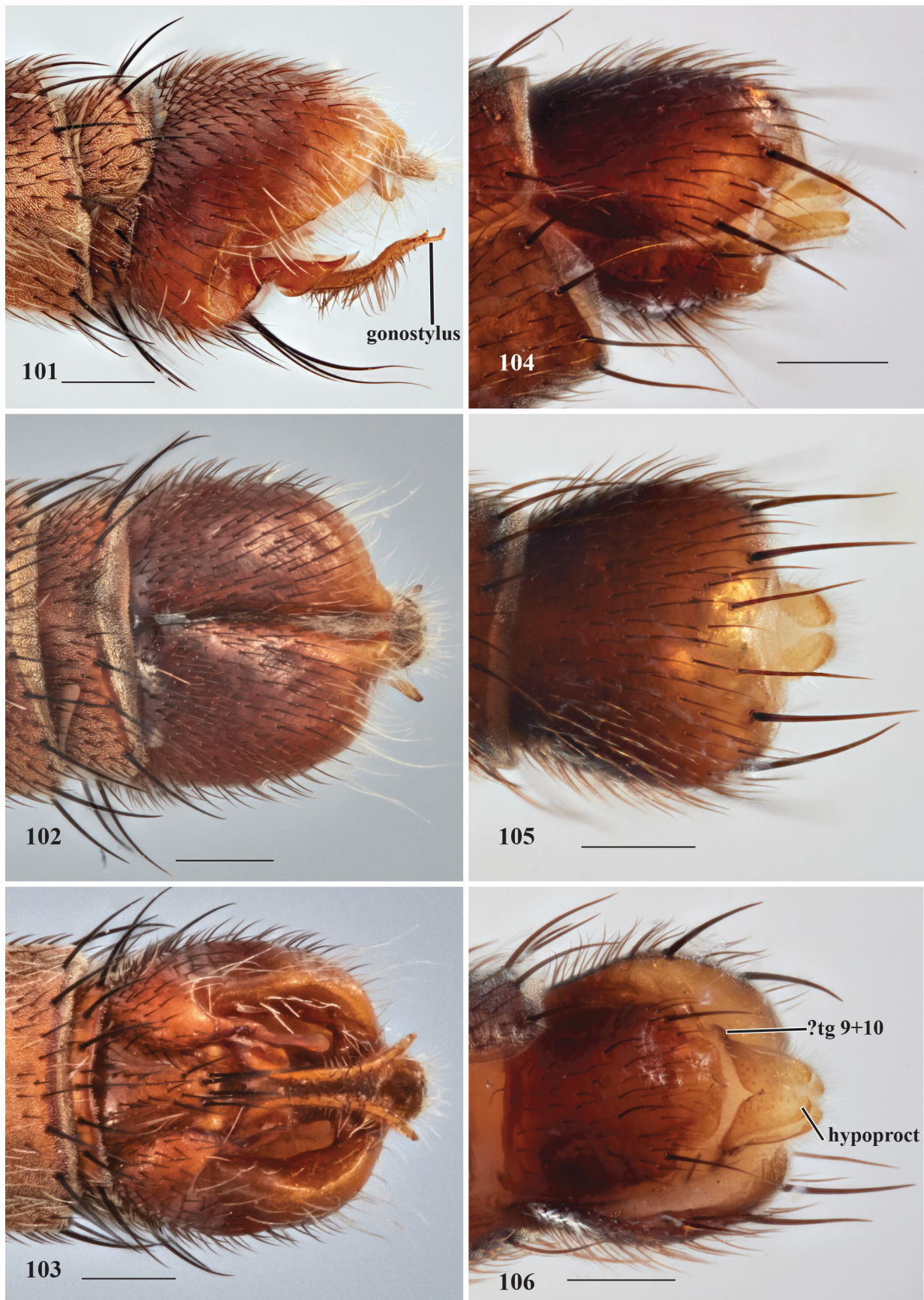
(Figs 4, 101–109, 116)

**Diagnosis.** Sternite 2 with long, erect setae scattered over most of surface.

**Type material.** **HOLOTYPE** ♂, AUSTRALIA. **Northern Territory.** 1 ♂, N.T. 12.45°S 132.53°E / Radon Ck (Rainforest) / 14–16 July 1979 / G. Monteith (Malaise) / (QM Reg. No. T207017). **PARATYPES.** **Northern Territory.** 3 ♀, same data as holotype (QM).

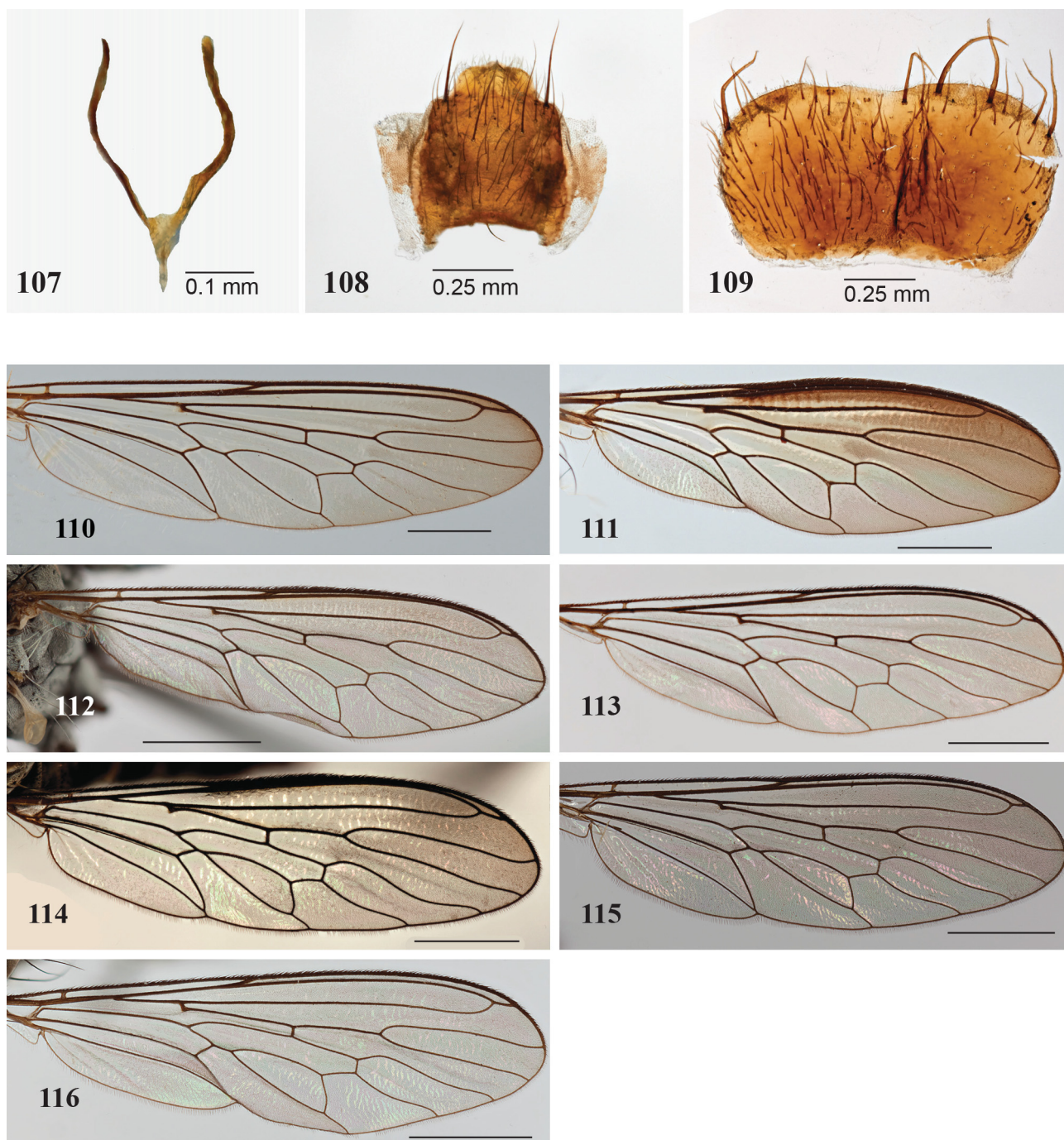
**Description. Male.** Body length, 7.9 mm; thoracic length, 2.0 mm; wing length, 5.3 mm. **Head.** Face gently rounded, protruding beyond eyes in profile and with silvery-white tomentum. Mystax with two vertical rows of long thin bristles, the uppermost 2 or 3 pairs black, remainder white and a with medial row of stouter, white bristles; ventrally admixed with smaller weaker white setae on lower half of face and epistomal margin. Ocellar tubercle with a pair of long erect or proclinate setae and a few smaller proclinate setae anteriorly. Occiput with several long black setae dorsally, weakening and becoming white ventrally. Flagellum about half as long as pedicel and conical. Style with setae in two ranks. **Thorax.** Ground colour black, lateral pleural sclerites with fine grey tomentum; mesonotum with brownish tomentum, becoming silver-grey laterally; postpronotal lobe with a black area anteriorly which lacks tomentum and with a few long, white setae anteriorly. Acrostichal setae seemingly absent but when viewed in profile setae are visible. Presutural dorsocentral bristles absent; 2 or 3 pairs of post-sutural dorsocentral bristles present. Scutellum dorsally with sparse, scattered setae and 2 long marginal bristles. Anepisternum bare, rarely with weak setae posteriorly. Anepimeral seta present. **Wing** (Fig. 116). Microtrichia uniformly distributed over most of wing, basal third with some cells with clear areas. Costal bulge absent. Vein R4+5 not fused basally to vein R3. **Legs.** Femora black, narrowly orange-brown at apex. Tibiae orange-brown, darker apically, hind tibia orange-brown, dark brown-black on apical two-thirds. Fore and mid metatarsi orange-brown, hind metatarsus brown-black; remainder of tarsal segments brown-black. Fore femur with an anterior bristle and a ventral row of long, weak setae. Mid femur with an anterior bristle at about middle and another at apical third; a posteroventral row of 4 or 5 weak bristles and a ventral row of weak bristles. Hind femur with an anterior bristle at about middle and another at apical third; an ventral row of 4 or 5 short, stout bristles and a posteroventral row of 4 or 5 long, fine bristles. Fore tibia with 2 long posteroventral setae; a short subbasal dorsal seta; a ventral row of 5 or 6 setae. Mid tibia with a stout anterodorsal bristle at about apical fourth and a similar ventral seta at about apical third; and an anteroventral row of 4 or 5 long fine, setae. Hind tibiae with a subapical, posterodorsal bristle and another longer anterior one at apical third; a posterodorsal bristle at about middle; a row of 4 anteroventral bristles and a posteroventral row of 5 or 6 long fine bristles. **Abdomen.** Mostly brownish tomentose, tergite 1 entirely and tergites 2–8 grey tomentose on lateral margins; posterior margins of tergites 2–8 white tomentose. Ground colour of tergites 5–8 noticeably more brownish orange than tergites 1–4. Sternite 2 with long, erect setae scattered over most of surface. Sternites 4–8 with subapical bristles on posterior margin. Posterolateral margins of tergites 2–6 with 2 or 3 pale bristles; posterior margin of tergites 2–8 with black bristles, the posterior bristles of tergites 7 and 8 not distinguishable from those on the posterolateral margin. **Terminalia** (Figs 101–103). Brown-orange, epandrium with a uniform covering of black setae, pale along posterior margin. Tergite 8 and sternite 8 with stout, black bristles on posterior margin. Epandrium (Figs 101, 102) very large and concealing the gonocoxite; dorsally with a small, rounded posterior lobe, basally with a ventral extension covering the gonocoxite and extending posteriorly to form a small, blade-like appendage; gonostylus very long, bowed about middle, extending posteriorly beyond cerci; ventral margin with dense short bristles. Hypandrium (Fig. 103) short, triangular with a broad base and basally fused to gonocoxite; with black setae longest and stoutest distally.





**FIGURES 101–106.** *Ommatius radamnisi* sp. nov. (101–103). Male terminalia. (101). Lateral view; (102). Dorsal view; (103). Ventral view. (104–106). Female terminalia. (104). Lateral view; (105). Dorsal view; (106). Ventral view. Abbreviations: tg, tergite. Scale bar, 0.25 mm.





**FIGURES 107–116.** (107–109). Terminalia of *Ommatius radamnisi* **sp. nov.** (107). Genital fork; (108). Sternite 8; (109). Tergite 8. (110–116). Right wing of male *Ommatius* spp. (110). *O. aquilonaris* **sp. nov.**; (111). *O. burwelli* **sp. nov.**; (112). *O. imaginis* **sp. nov.**; (113). *O. limbatus* **sp. nov.**; (114). *O. melasmus* **sp. nov.**; (115). *O. musselbrookensis* **sp. nov.**; (116). *Ommatius radamnisi* **sp. nov.** (female). (110). Scale bar, 1.00 mm and as indicated.

**Female.** Differs from male as follows: Body length, 5.7–6.4 mm; thoracic length, 1.3–1.5 mm; wing length, 4.0–4.5 mm. **Abdomen.** Segment 8 shining brown-orange, tergite 8 becoming black basally. **Terminalia** (Figs 104–109). Tergite 8 (Fig. 109) about twice as wide as long; posterior margin rounded with a concave medial area; anterior margin slightly concave; posterior margin with 8–10 stout, black bristles. Sternite 8 (Fig. 108) about as long as wide and with a small, medial carina on posterior margin; with a posterolateral indentation bearing a stout, black bristle; a subcircular pale area laterally near middle of length. Tergite 9+10 (Fig. 106), if present, reduced to 2 small sclerites proximally to anterior margin of hypoproct. Genital fork (Fig. 107) lateral arms narrow and with narrow anterior apodeme. Cerci (Figs 104–105) ovoid and about as long as hypoproct. Hypoproct (Fig. 106) fused



and with an anterior cleft and a rounded indent on posterior margin; setae on ventral surface with large basal sockets.

**Etymology.** From *rad* (L), in radium, and *amnis* (L), ‘stream of water’, after the type locality.

**Distribution** (Fig. 4). Known only from the type locality in Kakadu National Park, NT.

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## References

- Daniels, G. (1989) Family Asilidae. In: Evenhuis, N.L. (ed.), *Catalog of the Diptera of Australia and Oceania*, Bishop Museum Press and E.J. Brill: Honolulu and Leiden, pp. 326–349.
- Daniels, G. (2012) Asilidae. Australian Faunal Directory. Australian Biological Resources Study, Canberra. Available from: <http://www.environment.gov.au/biodiversity/abrs/online-resources/fauna/afd/taxa/Ommatius> (accessed June 2015)
- Dikow, T. (2009) Phylogeny of Asilidae inferred from morphological characters of imagines (Insecta: Diptera: Brachycera: Asiloidea). *Bulletin of the American Museum of Natural History*, 319, 1–175.  
<http://dx.doi.org/10.1206/603.1>
- Geller-Grimm, F. (2015) Robber Flies (Asilidae). Available from: <http://www.geller-grimm.de/morph/morph01.htm> (accessed June 2015)
- Hardy, G.H. (1928) Revisional notes on described Australian robber flies of the genus *Ommatius* (Asilidae). *Proceedings of the Royal Society of Queensland*, 40, 61–65.
- Hardy, G.H. (1935) The Asilidae of Australia.—Part III. *Annals and Magazine of natural History*, 10 (16), 161–187.
- Hardy, G.H. (1949) Miscellaneous notes on Australian Diptera. XIV. Venation and other notes. *Proceedings of the Linnean Society of New South Wales*, 73 (1948), 298–303.
- Hull, F.M. (1958) Some species and genera of the family Asilidae (Diptera). *Proceedings of the Entomological Society of Washington*, 60, 251–257.
- Hull, F.M. (1962) Robber flies of the world. The genera of the family Asilidae. *Bulletin. United States National Museum*, 224, x + 907. [2 parts]
- La Salle, J. (2015) Atlas of Living Australia. CSIRO, Canberra. Available from: <http://www.ala.org.au/> (accessed 1 February 2016)
- Londt, J.G.H. (1981) Afrotropical Asilidae (Diptera) 5. The genus *Dasophrys* Loew, 1858 (= *Hobbyus* Bromley, 1952) (Asilinae: Asilini). *Annals of the Natal Museum*, 24, 635–699.
- Malloch, J.R. (1928) Notes on Australian Diptera. No. xvii. *Proceedings of the Linnean Society of New South Wales*, 53, 598–617.
- McAlpine, J.F. (1981) Morphology and terminology—Adults. In: McAlpine, J.F., Peterson, B.V., Shewell, G.E., Teskey, H.J., Vockeroth, J.R. & Wood, D.M. (Eds.), *Manual of Nearctic Diptera. Vol. 1*. Monograph No. 27, Biosystematics Research Institute, Agriculture Canada, Ottawa, Ontario, pp. 9–63.
- Roskov, Y., Abucay, L., Orrell, T., Nicolson, D., Kunze, T., Culham, A., Bailly, N., Kirk, P., Bourgoin, T., DeWalt, R.E., Decock, W. & De Wever, A. (eds.) (2015) Species 2000 & ITIS Catalogue of Life, 2015 Annual Checklist. Species 2000: Naturalis, Leiden, the Netherlands. Available from: <http://www.catalogueoflife.org/col/search/all/key/ommatius/fossil/0/match/1> (accessed June 2016)
- Scarbrough, A.G. (1984) Synopsis of *Ommatius* Wiedemann (Diptera: Asilidae) from Hispaniola. *Journal of the New York Entomological Society*, 92, 131–149.
- Scarbrough, A.G. (1997) New and old species of *Ommatius* Wiedemann (Diptera: Asilidae) from Hispaniola. *Insecta Mundi*, 11, 9–24.
- Scarbrough, A.G. (2002) Synopsis of the Neotropical *holosericeus* complex of the genus *Ommatius* Wiedemann (Diptera: Asilidae): *ampliatus* and *holosericeus* species groups. *Transactions of the American Entomological Society*, 128, 133–222.